APPENDIX G

Economic Data

ECONOMIC AND FISCAL EFFECTS OF THE PROPOSED STATEWIDE REGULATIONS FOR ONSITE WASTEWATER TREATMENT SYSTEMS

Final Draft

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INTRODUCTION

This technical report analyses the economic and fiscal impacts of the Proposed Statewide Regulations for Onsite Wastewater Treatment Systems (OWTS), hereafter referred to as the Proposed Regulations. The analyses conducted for this report are consistent with the analytical requirements for Standard 399 Form, a state requirement for agencies proposing new regulations.

Standard 399 Form combines a Fiscal Impact Statement (FIS) with an Economic Impact Statement (EIS). A completed and signed Standard 399 Form must be submitted to the state Office of Administrative Law. The signature attests that the agency has completed the Standard 399 Form according to the instructions in SAM sections 6600-6680, and understands the impacts of the proposed rulemaking. A copy of the agency-signed Standard 399 Form must be transmitted to the California Department of Finance for signature when the applicable SAM sections require completion of a FIS.

This report is intended as a stand-alone document that provides sufficient information to complete the Standard 399 Form, and to prepare relevant sections of the draft EIR on the Proposed Regulations. The analyses conducted for this report address the following topics concerning implementation of the Proposed Regulations:

- Private sector costs, including costs to households and businesses
- Water quality benefits of the Proposed Regulations
- Comparative assessment of benefits and costs
- Economic impacts on OWTS-related businesses
- Fiscal impacts, including effects on local government, state government, and federal funding of state and local programs
- Potential property value and real estate transaction effects
- Economic and fiscal implications of potential growth effects

As allowed for by state Guidelines for preparing EISs, the economic and fiscal analyses described in this report focus on *direct* costs and benefits of the Proposed Regulations. The analyses rely on existing and readily available information and data; no new, primary data (e.g., surveys or structured interviews) were collected.

The analyses evaluate an implementation scenario that consists of numerous assumptions and interpretations about how the Proposed Regulation would be implemented. The effect of changes in these assumptions on study results was considered as part of a sensitivity analysis.

The economic analysis considers effects of the Proposed Regulations concerning waters both within 303(d)-listed areas and outside of these areas. The 303(d)-listed water bodies where economic effects were evaluated include Northern Santa Monica Bay beaches, Malibu Creek watershed, Santa Clara River, Lake Elsinore, Rainbow Creek, and Canyon Lake. For evaluating effects concerning these 303(d)-listed areas, estimates of the number of affected properties were developed by the State Water Board staff. For evaluating effects outside of the 303(d)-listed areas, case study analyses were conducted of two counties: Merced County, which is believed to require a high incidence of compliance (e.g., the area currently has relatively lax regulations) and

Los Angeles County, which is believed to require a low incidence of compliance (e.g., the area currently has more stringent existing regulations). These case study analyses were conducted to assess the relative burdens and industry opportunities of the Proposed Regulations for counties similar to the case study counties.

As specified in the Guidelines for Standard 399 Form, the analyses of cost compliance and OWTS-related business effects were conducted over a 5-year period, beginning in 2009 and ending in 2013. Baseline conditions consisting of estimates of annual costs and benefits under future no project conditions were developed and aggregated over this 5-year time horizon. The economic analyses focused on comparing aggregated costs and benefits for the Proposed Regulation to this future no-project baseline condition. For purposes of consistency with other technical evaluations for the draft EIR, annual costs and benefits of the Proposed Regulations were also compared to existing 2008 conditions. The analysis of fiscal impacts focused on assessing the incremental costs incurred by local agencies and the regional boards compared to existing conditions.

BACKGROUND INFORMATION

This section of the report presents background information for assessing the economic and fiscal impacts of the Proposed Regulations, including information used to establish baseline conditions for the assessment. Data presented in this section represent the most-current data available. Information on representative unit costs for OWTS-related design, installation and maintenance, and details of the calculations of the number of businesses on OWTS are presented in Attachments A and B, respectively.

Households on OWTS in California

From 1970 through 1990, the U.S. Census Bureau, as part of its decennial housing and population census, collected information on the number of housing units using septic systems for sewage disposal. (This information was not collected as part of the 2000 Census.) Table 1 shows the results of the census surveys for 1970, 1980, and 1990 for California. The percentage of occupied year-round housing units using septic systems in California declined between 1970 and 1980, but stabilized between 1980 and 1990. As Table 1 shows, the percentage of housing units on septic systems fell from 12.2% to 10.0% between 1970 and 1980, but declined only slightly, to 9.8%, by 1990. Excluding seasonal and vacant housing units, approximately 1,092,200 housing units were hooked up to septic systems in 1990.

Table 1. Number of Housing Units with Onsite Wastewater Treatment Systems in California, 1970-1990

Year	Number of Housing Units with Septic Tanks or Cesspools	Percent of Total Housing Units	Percent of Total Households
1970	853,013	12.2%	12.9%
1980	920,690	10.0%	10.7%
1990	1,092,174	9.8%	10.5%

Note: Housing unit totals do not include seasonal and vacant housing units.
Sources: U.S. Census Bureau 2002, 2006a.

Housing Units on OWTS in 1999 and 2000

A 2003 study jointly prepared by the California Wastewater Training & Research Center at California State University, Chico, (CSUC) and the U.S. Environmental Protection Agency (USEPA) estimated that about 1,202,300 housing units were using septic systems in 1999 (Table 2). According to the study, this estimate was prepared by adding the number of OWTS installed since 1990 to the number of systems reported by the 1990 Census. The source for the number of systems installed since 1990 came from a survey of officials of public agencies that have jurisdiction for approving and inspecting OWTS in California. The CSUC-EPA study estimated that 9.9 percent of all housing units in California were using septic systems, virtually the same as the percentage reported by the 1990 U.S. Census (9.8 percent).

For purposes of comparison, the number of housing units in California using OWTS in 2000 was estimated using data from the 1990 and 2000 U.S. Census. Starting with the number of existing housing units statewide in 2000, as reported by the 2000 U.S. Census, it was then assumed that

statewide OWTS usage in 2000, on a percentage basis, was the same as the percentage in 1990 (9.8 percent). This percentage was applied to the total number of housing units statewide in 2000 to arrive at an estimate of the total number of housing units using OWTS within the state. These units were then distributed among the counties based on each county's percentage share of statewide OWTS in 1990. As Table 2 shows, this methodology resulted in an estimated total of 1,192,900 housing units using OWTS in California in 2000.

This "Census-based" estimate of 1,192,900 housing units on OWTS is about 0.8 percent lower than the CSUC-EPA estimate of 1,202,300 housing units with OWTS in 1999. Although the difference in the statewide estimates of total OWTS is minor, larger differences occur at the county level, as shown by the last column of Table 2. For example, the Census-based estimate of housing units with OWTS was 9 percent higher than the CSUC-EPA estimate for Kern and Orange Counties and about 14 percent lower for Mono County.

Because of concerns about the accuracy of the survey results on which the CSUC-EPA estimates are based, both the Census-based and CSUC-EPA estimates were used as a basis for projecting OWTS usage at the county level for both existing (2008) conditions and 2013 conditions. Because the statewide estimates produced by the two estimation methodologies are similar, 1.2 million OWTS was used as the total number of OWTS in use statewide in 2000.

Housing Units on OWTS under Existing Baseline (2008) Conditions

Based on the Census and CSUC-EPA estimates of OWTS usage in1990 and 1999, two sets of projections of OWTS usage in 2008 were prepared. Both sets of projections, hereafter referred to as the Census-based and CSUC-EPA-based projections, used estimates of the statewide percentage of housing units using OWTS as the basis for estimating OWTS usage to 2008. The following steps were employed in developing the 2008 estimates:

- Projections of housing units for 2008 were developed by adjusting 2006 county-level housing estimates made by the California Department of Finance (2006). Specifically, the average annual population growth rate for each county projected by the Department of Finance (2004) for the 2000–2010 period was used as the basis for projecting the growth in housing units in each county from 2006 to 2008. These units were summed across all counties to arrive at a statewide projection of total housing units in 2008.

- To estimate the total number of housing units using OWTS statewide in 2008, it was assumed that future statewide OWTS usage, on a percentage basis, would be the same as the 1990 Census rate (9.8%) for the Census-based projection and the 1999 CSUC-EPA rate (9.9%) for the CSUC-EPA-based projection. These rates were applied to the projected total number of housing units statewide in 2008 to arrive at an estimate of the total number of housing units using OWTS within the state for each set of projections.

Table 2. Estimates of Housing Units with OWTS, by County, 1990, 1999, and 2000

County	1990 US CENSUS			ESTIMATED 1999 (CSUC)			ESTIMATED 2000 (CENSUS-BASED)			Difference Between Census-Based and CSUC Estimates
	Total Housing Units	Housing Units Using OWTS [1]	Percentage of Housing Units Using OWTS	Total Housing Units	Housing Units Using OWTS[2]	Percentage of Housing Units Using OWTS	Total Housing Units	Housing Units Using OWTS	Percentage of Housing Units Using OWTS	
Alameda	504,109	4,264	0.8%	531,166	4,489	0.8%	540,183	4,657	0.9%	3.8%
Alpine	1,319	451	34.2%	1,461	551	37.7%	1,514	493	32.5%	-10.6%
Amador	12,814	7,642	59.6%	14,905	9,600	64.4%	15,035	8,347	55.5%	-13.1%
Butte	76,115	41,142	54.1%	86,563	44,314	51.2%	85,523	44,938	52.5%	1.4%
Calaveras	19,153	12,978	67.8%	22,937	15,378	67.0%	22,946	14,175	61.8%	-7.8%
Colusa	6,295	2,213	35.2%	7,085	2,507	35.4%	6,774	2,417	35.7%	-3.6%
Contra Costa	316,170	9,422	3.0%	349,912	11,222	3.2%	354,577	10,291	2.9%	-8.3%
Del Norte	9,091	4,582	50.4%	10,688	5,230	48.9%	10,434	5,005	48.0%	-4.3%
El Dorado	61,451	25,859	42.1%	71,974	32,609	45.3%	71,278	28,245	39.6%	-13.4%
Fresno	235,563	38,361	16.3%	270,782	42,861	15.8%	270,767	41,900	15.5%	-2.2%
Glenn	9,329	4,310	46.2%	10,174	4,686	46.1%	9,982	4,708	47.2%	0.5%
Humboldt	51,134	15,365	30.0%	56,576	16,265	28.7%	55,912	16,782	30.0%	3.2%
Imperial	36,559	6,431	17.6%	43,067	6,651	15.4%	43,891	7,024	16.0%	5.6%
Inyo	8,712	1,951	22.4%	9,078	2,191	24.1%	9,042	2,131	23.6%	-2.7%
Kern	198,636	46,939	23.6%	231,629	46,939	20.3%	231,564	51,269	22.1%	9.2%
Kings	30,843	5,074	16.5%	36,176	5,533	15.3%	36,563	5,542	15.2%	0.2%
Lake	28,822	12,452	43.2%	31,910	13,452	42.2%	32,528	13,601	41.8%	1.1%
Lassen	10,358	4,943	47.7%	11,635	5,854	50.3%	12,000	5,399	45.0%	-7.8%
Los Angeles	3,163,343	77,839	2.5%	3,261,750	80,135	2.5%	3,270,909	85,020	2.6%	6.1%
Madera	30,831	15,342	49.8%	39,018	17,526	44.9%	40,387	16,757	41.5%	-4.4%
Marin	99,757	7,476	7.5%	104,420	9,276	8.9%	104,990	8,166	7.8%	-12.0%
Mariposa	7,700	5,617	72.9%	9,146	6,347	69.4%	8,826	6,135	69.5%	-3.3%
Mendocino	33,649	16,949	50.4%	37,112	20,520	55.3%	36,937	18,513	50.1%	-9.8%
Merced	58,410	13,975	23.9%	68,542	15,000	21.9%	68,373	15,264	22.3%	1.8%
Modoc	4,672	2,773	59.4%	5,183	3,275	63.2%	4,807	3,029	63.0%	-7.5%
Mono	10,664	1,882	17.6%	11,651	2,400	20.6%	11,757	2,056	17.5%	-14.3%
Monterey	121,224	19,230	15.9%	130,924	21,154	16.2%	131,708	21,004	15.9%	-0.7%

Table 2 (cont.). Estimates of Housing Units with OWTS, by County, 1990, 1999, and 2000

County	1990 US CENSUS			ESTIMATED 1999 (CSUC)			ESTIMATED 2000 (CENSUS-BASED)			Difference Between Census-Based and CSUC Estimates
	Total Housing Units	Housing Units Using OWTS [1]	Percentage of Housing Units Using OWTS	Total Housing Units	Housing Units Using OWTS[2]	Percentage of Housing Units Using OWTS	Total Housing Units	Housing Units Using OWTS	Percentage of Housing Units Using OWTS	
Napa	44,199	8,566	19.4%	48,373	9,450	19.5%	48,554	9,356	19.3%	-1.0%
Nevada	37,352	19,588	52.4%	44,605	22,988	51.5%	44,282	21,395	48.3%	-6.9%
Orange	875,072	6,708	0.8%	954,882	6,708	0.7%	969,484	7,327	0.8%	9.2%
Placer	77,879	21,395	27.5%	102,344	23,315	22.8%	107,302	23,369	21.8%	0.2%
Plumas	11,942	7,416	62.1%	13,812	9,286	67.2%	13,386	8,100	60.5%	-12.8%
Riverside	483,847	96,738	20.0%	569,287	113,238	19.9%	584,674	105,662	18.1%	-6.7%
Sacramento	417,574	16,637	4.0%	464,470	18,887	4.1%	474,814	18,172	3.8%	-3.8%
San Benito	12,230	4,193	34.3%	15,954	4,993	31.3%	16,499	4,580	27.8%	-8.3%
San Bernardino	542,332	124,684	23.0%	604,060	132,000	21.9%	601,369	136,187	22.6%	3.2%
San Diego	946,240	61,603	6.5%	1,026,142	71,930	7.0%	1,040,149	67,286	6.5%	-6.5%
San Francisco	328,471	624	0.2%	337,983	0	0.0%	346,527	682	0.2%	0.0%
San Joaquin	166,274	25,897	15.6%	186,718	28,033	15.0%	189,160	28,286	15.0%	0.9%
San Luis Obispo	90,200	24,677	27.4%	99,905	26,700	26.7%	102,275	26,954	26.4%	0.9%
San Mateo	251,782	6,080	2.4%	261,434	6,360	2.4%	260,576	6,641	2.5%	4.4%
Santa Barbara	138,149	9,814	7.1%	145,135	11,434	7.9%	142,901	10,719	7.5%	-6.2%
Santa Clara	540,240	18,132	3.4%	581,532	19,000	3.3%	579,329	19,805	3.4%	4.2%
Santa Cruz	91,878	25,563	27.8%	96,679	26,693	27.6%	98,873	27,921	28.2%	4.6%
Shasta	60,552	26,596	43.9%	71,042	28,516	40.1%	68,810	29,050	42.2%	1.9%
Sierra	2,166	1,396	64.5%	2,295	1,521	66.3%	2,202	1,525	69.2%	0.2%
Siskiyou	20,141	8,712	43.3%	21,989	9,760	44.4%	21,947	9,516	43.4%	-2.5%
Solano	119,533	5,618	4.7%	134,294	5,938	4.4%	134,513	6,136	4.6%	3.3%
Sonoma	161,062	40,980	25.4%	180,415	43,360	24.0%	183,153	44,761	24.4%	3.2%
Stanislaus	132,027	25,714	19.5%	149,966	26,360	17.6%	150,807	28,086	18.6%	6.5%
Sutter	24,163	10,671	44.2%	29,080	11,671	40.1%	28,319	11,655	41.2%	-0.1%
Tehama	20,403	11,813	57.9%	23,784	13,669	57.5%	23,547	12,903	54.8%	-5.6%
Trinity	7,540	5,364	71.1%	8,074	5,790	71.7%	7,980	5,859	73.4%	1.2%
Tulare	105,013	31,338	29.8%	120,211	34,238	28.5%	119,639	34,229	28.6%	0.0%

Table 2 (cont.). Estimates of Housing Units with OWTS, by County, 1990, 1999, and 2000

County	1990 US CENSUS[1]			ESTIMATED 1999 (CSUC)[2]			ESTIMATED 2000 (CENSUS-BASED)			Difference Between Census-Based and CSUC Estimates
	Total Housing Units	Housing Units Using OWTS	Percentage of Housing Units Using OWTS	Total Housing Units	Housing Units Using OWTS[2]	Percentage of Housing Units Using OWTS	Total Housing Units[3]	Housing Units Using OWTS[4]	Percentage of Housing Units Using OWTS	
Tuolumne	25,175	14,709	58.4%	28,252	16,013	56.7%	28,336	16,066	56.7%	0.3%
Ventura	228,478	14,809	6.5%	248,500	16,701	6.7%	251,712	16,175	6.4%	-3.1%
Yolo	53,000	4,564	8.6%	59,911	5,164	8.6%	61,587	4,985	8.1%	-3.5%
Yuba	21,245	6,113	28.8%	23,230	6,585	28.3%	22,636	6,677	29.5%	1.4%
Total	11,182,882	1,092,174	9.8%	12,119,822	1,202,266	9.9%	12,214,549	1,192,932	9.8%	-0.8%

Notes and sources:
[1] Source: 1990 US Census.
[2] Source: California Wastewater Training & Research Center, California State University, Chico, and Environmental Protection Agency, Region 9, 2003.
[3] Source: 2000 US Census.
[4] Estimated by assuming that statewide OWTS usage in 2000, on a percentage basis, was the same as the percentage in 1990 (9.8%). This percentage was applied to the total number of housing units statewide in 2000 to arrive at an estimate of the total number of housing units using OWTS within the state. These units were then distributed among the counties based on each county's percentage share of statewide OWTS in 1990.

- The projected statewide units using OWTS were then distributed among the counties based on each county's percentage share of statewide OWTS usage in 1990 for the Census-based projection and for 1999 for the CSUC-EPA-based projection.

As Table 3 shows, this methodology resulted in a Census-based projection of 1,323,500 housing units using OWTS, and a CSUC-based projection of 1,344,300 housing units using OWTS in California in 2008, a difference of about 1.6 percent.

Projected Housing Units on OWTS under Future Baseline (2013) Conditions

Two sets of OWTS usage projections for 2013 were developed, generally using the same methodology as that employed to develop 2008 projections. In summary, estimates were developed in the following manner:

1. Housing unit projections were developed for 2013.
2. Statewide percentages of OWTS usage from the 1990 Census and the 1999 CSUC study were applied to the housing projections.
3. The projections of housing units statewide using OWTS were distributed among the counties based on county shares of statewide OWTS usage in 1990 and 1999.

The methodology used for the 2013 projections differed only in how the projections of total housing units at the county level were developed. For 2013, housing unit projections were developed by interpolating between 2010 and 2020 population levels for each county, as projected by the California Department of Finance (2004), and then dividing the resulting 2013 population levels by the average number of persons per housing unit in each county, as estimated by the California Department of Finance (2006).

As Table 3 shows, this methodology resulted in a Census-based projection of 1,438,000 housing units using OWTS and a CSUC-based projection of 1,460,600 housing units using OWTS in California in 2013, a difference of about 1.6 percent. These 2013 projections of OWTS usage represent an 8.6 percent increase in statewide OWTS usage compared to their respective 2008 projections of OWTS usage.

OWTS household growth rates in 303(d) areas for 2013 future baseline and 2013 Proposed Regulations conditions were assumed to be the same as the growth rates projected for the counties in which each area is located. The exception is Malibu Creek, which is assumed to experience no new OWTS growth between 2009 and 2013 due to built-out conditions.

Businesses on OWTS in California

In addition to household usage of OWTS, OWTS are also used by a small percentage of businesses in the state. No information, however, is available from the U.S. Census concerning historical or current numbers of businesses using OWTS in California. Professionals who provided information for this study were familiar with only one California county, Sonoma County, that has compiled these data. Consequently, information from Sonoma County, which

Table 3. Projected Housing Units with OWTS in 2008 and 2013

County	2008 Projections			2013 Projections		
		Units with OWTS			Units with OWTS	
	Total Housing Units[1]	Census-Based Estimate[2]	CSUC-Based Estimate[3]	Total Housing Units[4]	Census-Based Projection[5]	CSUC-Based Projection[6]
Alameda	577,988	5,167	5,019	651,149	5,614	5,453
Alpine	1,761	547	616	1,942	594	669
Amador	17,296	9,261	10,734	20,216	10,062	11,662
Butte	95,514	49,857	49,550	105,328	54,168	53,834
Calaveras	27,822	15,727	17,195	31,032	17,087	18,682
Colusa	7,890	2,682	2,803	8,557	2,914	3,046
Contra Costa	397,729	11,418	12,548	445,696	12,405	13,633
Del Norte	11,071	5,553	5,848	12,849	6,033	6,354
El Dorado	84,551	31,337	36,462	92,253	34,047	39,615
Fresno	308,259	46,487	47,925	337,429	50,507	52,069
Glenn	10,729	5,223	5,240	11,219	5,675	5,693
Humboldt	59,492	18,620	18,187	62,098	20,230	19,759
Imperial	54,283	7,793	7,437	63,245	8,467	8,080
Inyo	9,233	2,364	2,450	9,302	2,569	2,662
Kern	274,335	56,882	52,485	300,999	61,801	57,023
Kings	42,254	6,149	6,187	53,451	6,681	6,722
Lake	35,215	15,090	15,041	39,138	16,395	16,342
Lassen	13,047	5,990	6,546	18,330	6,508	7,112
Los Angeles	3,428,202	94,328	89,603	3,538,981	102,484	97,351
Madera	48,582	18,592	19,597	55,217	20,200	21,291
Marin	108,084	9,060	10,372	112,107	9,843	11,269
Mariposa	10,124	6,807	7,097	11,406	7,395	7,711
Mendocino	39,660	20,539	22,944	42,541	22,315	24,928
Merced	85,216	16,935	16,772	99,975	18,400	18,223
Modoc	5,113	3,360	3,662	5,127	3,651	3,979
Mono	13,921	2,281	2,684	15,345	2,478	2,916
Monterey	142,028	23,304	23,653	161,543	25,319	25,699
Napa	54,397	10,381	10,567	61,176	11,278	11,480
Nevada	50,536	23,737	25,704	55,830	25,790	27,927
Orange	1,047,364	8,129	7,501	1,123,108	8,832	8,149
Placer	151,540	25,927	26,070	170,762	28,169	28,324
Plumas	15,023	8,987	10,383	14,838	9,764	11,281
Riverside	779,191	117,230	126,617	873,495	127,367	137,566
Sacramento	564,125	20,161	21,119	659,086	21,905	22,945
San Benito	18,276	5,081	5,583	20,399	5,521	6,066
San Bernardino	693,509	151,096	147,596	760,348	164,162	160,359
San Diego	1,152,920	74,653	80,429	1,275,615	81,108	87,383
San Francisco	360,189	756	0	374,953	822	0
San Joaquin	233,597	31,383	31,345	276,639	34,097	34,056
San Luis Obispo	115,232	29,904	29,855	130,078	32,490	32,436

Table 3 (cont.). Projected Housing Units with OWTS in 2008 and 2013

	2008 Estimates			2013 Projections		
		Units with OWTS			Units with OWTS	
County	Total Housing Units[1]	Census-Based Estimate[2]	CSUC-Based Estimate[3]	Total Housing Units[4]	Census-Based Projection[5]	CSUC-Based Projection[6]
San Mateo	269,592	7,368	7,111	283,804	8,005	7,726
Santa Barbara	155,467	11,893	12,785	168,614	12,921	13,890
Santa Clara	623,202	21,973	21,245	664,852	23,873	23,082
Santa Cruz	104,444	30,978	29,847	112,648	33,657	32,428
Shasta	78,137	32,230	31,885	87,002	35,017	34,642
Sierra	2,259	1,692	1,701	2,339	1,838	1,848
Siskiyou	23,446	10,557	10,913	23,463	11,470	11,857
Solano	153,620	6,808	6,640	178,168	7,397	7,214
Sonoma	198,450	49,661	48,483	224,752	53,955	52,675
Stanislaus	180,063	31,161	29,474	199,146	33,856	32,023
Sutter	33,804	12,931	13,050	36,282	14,050	14,178
Tehama	26,472	14,315	15,284	27,462	15,553	16,606
Trinity	8,392	6,500	6,474	8,119	7,062	7,034
Tulare	138,061	37,976	38,283	152,137	41,260	41,594
Tuolumne	30,611	17,825	17,905	34,679	19,366	19,453
Ventura	277,984	17,946	18,674	296,109	19,498	20,289
Yolo	74,893	5,531	5,774	91,935	6,009	6,273
Yuba	27,594	7,408	7,363	29,306	8,049	8,000
Total	13,551,786	1,323,533	1,344,314	14,723,621	1,437,980	1,460,559

Notes and sources:

[1] Estimated for 2008 by adjusting 2006 county-level housing estimates made by the California Department of Finance (2006) by the average annual population growth rate for each county projected by the Department of Finance (2004) for the 2000-2010 period.

[2] Estimated for 2008 by assuming that future statewide OWTS usage, on a percentage basis, will be the same as the 1990 Census rate (9.8%). This rate was applied to the projected total number of housing units statewide in 2008 to arrive at an estimate of the total number of housing units using OWTS within the state. These units were then distributed among the counties based on each county's percentage share of statewide OWTS in 1990.

[3] Estimated for 2008 by assuming that future statewide OWTS usage, on a percentage basis, will be the same as the 1999 CSUC rate (9.9%). This rate was applied to the projected total number of housing units statewide in 2008 to arrive at an estimate of the total number of housing units using OWTS within the state. These units were then distributed among the counties based on each county's percentage share of statewide OWTS in 1999.

[4] Housing unit projections for 2013 were developed by interpolating between 2010 and 2020 population levels for each county, as projected by the California Department of Finance (2004), and then dividing the resulting 2013 population level by the average number of persons per housing unit in each county, as estimated by the California Department of Finance (2006).

[5] Projected to 2013 by assuming that future statewide OWTS usage, on a percentage basis, will be the same as the 1990 Census rate (9.8%). This rate was applied to the projected total number of housing units statewide in 2013 to arrive at an estimate of the total number of housing units using OWTS within the state. These units were then distributed among the counties based on each county's percentage share of statewide OWTS in 1990.

[6] Projected to 2013 by assuming that future statewide OWTS usage, on a percentage basis, will be the same as the 1999 CSUC rate (9.9%). This rate was applied to the projected total number of housing units statewide in 2013 to arrive at an estimate of the total number of housing units using OWTS within the state. These units were then distributed among the counties based on each county's percentage share of statewide OWTS in 1999.

includes an OWTS inventory and report (Sonoma County 2007) funded by an EPA Class V injection well inventory grant, was used to estimate the number of businesses on OWTS. Information from the report includes the following:

- 102 OWTS met the EPA's Class V high volume criterium,
- 271 OWTS met the EPA's Class V high strength criterium, and
- an additional 531 OWTS were discharging "sanitary" waste from offices, warehouses, retail stores, etc.

Based on these findings, it is estimated that Sonoma County currently has 904 OWTS being used by businesses. With about 50,000 systems countywide (see Table 3 for the number of household OWTS in Sonoma County), businesses account for about 2 percent of all OWTS in Sonoma County.

The number and percentage of businesses using OWTS vary from county to county depending on many factors, including the size of a county, the number of businesses within a county, and whether businesses in a county are concentrated in sewered areas or spread out in non-sewered areas. Discussions with U.S. EPA staff (Janes, pers. comm., 2007), however, suggest that the 2 percent number from Sonoma County is considered to be likely representative of the number of businesses statewide using OWTS.

Approximately half of the OWTS being used by businesses consist of large-capacity/high-flow volume systems. (Large-capacity/high-flow volume systems are referred to as Class V injection wells by the U.S.EPA.) Because the Proposed Regulations would become the default regulations that apply to all OWTS in California in the future, certain requirements of the Proposed Regulations could apply to these large-capacity/high-flow volume systems. Most of these systems, however, are currently and individually regulated by Regional Water Boards through the use of Waste Discharge Requirements (WDRs), effectively exempting these regulated systems from the requirements of the Proposed Regulations. Therefore, the effects of the Proposed Regulations on large-capacity/high-flow volume systems are anticipated to be limited to a small number of systems that are not regulated by WDRs. Although this small number of large-capacity/high-flow volume systems may face higher costs under the Proposed Regulations, it would be highly speculative to estimate how many existing or new systems would be subject to the Proposed Regulations in the future rather than to WDR requirements. Because of this uncertainty and the anticipated limited effects of the Proposed Regulations on large-capacity/high-flow volume systems, no attempt was made to estimate the regional or statewide costs of these systems to comply with the Proposed Regulations.

The proposed OWTS regulations, however, are expected to affect certain kinds of businesses more than others, such as high-strength waste dischargers that may be required to add supplemental treatment. Restaurants would be the major type of business affected by this proposed requirement (Bradley, pers. comm., 2007). Data are not available on the number of restaurants using OWTS in California, in the case-study counties of Los Angeles and Merced, or in the counties where the 303(d)-listed water bodies are located to assess potential costs for high-strength waste dischargers. Data, however, are available from the U.S. Census Bureau (2006b) to

estimate the percentage of total businesses in each geographic area of interest that are restaurants and food services businesses to be affected by the Proposed Regulations.

According to data from the 2004 County Business Patterns report, 6.3 percent of all business establishments in California are restaurant or food services businesses. In Los Angeles and Merced counties, restaurants and other food service businesses account for 5.9 percent and 6.7 percent, respectively, of all businesses in these counties. In the counties in which 303(d) areas are located (in addition to Los Angeles County), restaurant and food service businesses account for 6.7 percent in Riverside County, 6.1 percent in San Diego County, and 5.7 percent in Ventura County. For this study, these percentages were used to estimate the number of businesses on OWTS that are high-strength waste dischargers subject to the Proposed Regulations under both 2008 and 2013 conditions.

Projecting the Number Businesses on OWTS to 2008 and 2013

The methods used to project the number of businesses using OWTS in 2008 and 2013 are described in detail in Attachment B to this report. As discussed there, it was assumed that between 0.5 percent and 2.0 percent of all businesses in California would be using OWTS in 2008 and 2013. For the case-study counties of Los Angeles and Merced, and for the 303(d) areas, percentages were developed specific to each geographic area, as described in Attachment B.

Existing Baseline (2008) Conditions

Statewide, the number of businesses using OWTS in 2008 is estimated to range from 4,450-17,810 businesses, including 4,400-17,400 businesses that fall into the small business category. In the case-study counties, the number of businesses on OWTS in 2008 was estimated at 1,770 (1,730 small businesses) in Los Angeles County and 190 (180 small businesses) in Merced County.

For the 303(d) areas, the same methodology used to estimate business OWTS usage in the case-study counties was used to estimate business OWTS usage in the 303(d) areas (refer to Attachment B). As background, the SWRCB has identified 10 water bodies with adopted TMDLs that identify OWTS as contributing to bacteriologic and/or nutrient impairment. The areas within 600 feet of these water bodies are referred to as 303(d) areas. Based on roof-top counts from aerial photographs, the SWRCB (Thompson, pers. comm., 2007) provided estimates of the number of structures (homes and businesses) within 600 feet of the water bodies that the Proposed Regulations could affect. The estimated number of structures (homes and businesses) on OWTS within 600 feet of an impaired water body in the 10 watersheds totaled 7,698 units, distributed as follows:

- Malibu Creek (Los Angeles County): 800 OWTS
- Sonoma Creek (Sonoma County): 200 OWTS
- Napa River (Napa County): 350 OWTS
- Northern Santa Monica Bay Beaches (Los Angeles County): 1,563 OWTS
- Santa Clara River (Ventura and Los Angeles counties): 200 OWTS

- Tomales Bay (Marin County): 350 OWTS
- Canyon Lake (Riverside County): 0 OWTS
- Lake Elsinore (Riverside County): 35 OWTS
- Rainbow Creek (San Diego County): 200 OWTS
- San Lorenzo River (Santa Cruz County): 4,000 OWTS

It should be noted that the SWRCB identified no homes or businesses located in the Canyon Lake 303(d) area; therefore, no businesses were projected for this area in 2008 or 2013. Additionally, per Item D of the 303(d) section of the Proposed Regulations, the San Lorenzo watershed, Sonoma Creek, Napa River, and Tomales Bay have an exemption from the regulations and are assumed to not be affected by the regulations; therefore, no businesses were projected for these areas in 2008 or 2013. As a result, the cost assessment in this report focused on the 2,798 potentially-affected units in the remaining five 303(d) areas.

Based on the methodology described in Attachment B, the number of businesses on OWTS within 600 feet of the five affected 303(d) areas for 2008 was as follows.

- Malibu Creek (Los Angeles County): 6 businesses
- Northern Santa Monica Bay Beaches (Los Angeles County): 11 businesses
- Santa Clara River (Ventura and Los Angeles counties): 2 businesses
- Lake Elsinore (Riverside County): 2 businesses
- Rainbow Creek (San Diego County): 4 businesses

Future Baseline (2013) Conditions

Statewide, the number of businesses using OWTS in 2013 is projected to range from 4,755-19,025 businesses, including 4,630-18,530 small businesses. In the case-study counties, the number of businesses on OWTS in 2013 was projected to total 1,870 (1,830 small businesses) in Los Angeles County and 195 (190 small businesses) in Merced County.

For the 303(d) areas, the projected change in the number of businesses using OWTS between 2008 and 2013 is anticipated to be very small because of the small number of businesses estimated to be currently using OWTS in these areas and because of the estimated slow rate of business growth for these areas. For 2013, the number of businesses on OWTS in the five affected 303(d) areas was projected as follows.

- Malibu Creek (Los Angeles County): 6 businesses (Note: Due to the built-out nature of the Malibu Creek 303(d) area, no growth in businesses is anticipated in this area between 2008 and 2013)
- Northern Santa Monica Bay Beaches (Los Angeles County): 11 businesses
- Santa Clara River (Ventura and Los Angeles counties): 2 businesses
- Lake Elsinore (Riverside County): 2 businesses
- Rainbow Creek (San Diego County): 4 businesses

OWTS-Related Support Businesses

Changes in statewide OWTS regulations could beneficially affect businesses that support the installation, maintenance, and monitoring of OWTS. Data on business activity (e.g., number of establishments, employees, payroll) are generally available from two U.S. Census Bureau reports: the annual County Business Patterns report and the Economic Census report, which is released every five years. For the purposes of this analysis, data from the 2004 County Business Patterns report for California were used because they are the most-recent data available for this study and because they reflect industrial-sector-level data at the county level. Note that sector-level data were collected according to North American Industry Classification System (NAICS) codes rather than Standard Industrial Classification (SIC) codes because the NAICS sectors provide more-detailed sectors for those of interest to this study.

The industrial sectors comprising the businesses most likely to be beneficially affected by the Proposed Regulations are shown in Tables 4, 5, and 6. These include businesses that manufacture, sell, install, and service OWTS. Table 4 summarizes statewide data on the number of businesses, employees, and payroll for the larger industrial sectors in which the OWTS-related businesses are located. Similar data are presented for the case study counties of Los Angeles and Merced in Tables 5 and 6, respectively. Note that data were unavailable for several Merced County sectors due to the small number of businesses in these sectors. In these cases, data from the U.S. Census Bureau's Nonemployer Statistics database (2006c) were used to supplement data from the County Business Patterns report. More detail regarding these sources is provided in the footnotes for Table 6.

For purposes of providing baseline data for the EIS and FIS, which require identification of impacts on "small businesses," estimates of the number of establishments in each industrial sector that fall into the small business category are presented in Tables 4, 5, and 6. The EIS Guidelines (California Trade and Commerce Agency[1] 1999) suggest using the small-business definitions in California Government Code Section 11342.610 to identify small businesses potentially affected by new regulations. According to this code section, a small business is one that is independently owned and operated and is not dominant in its field of operation. In this code section, several business activities are specifically excluded from the small business category (e.g., insurance companies, financial institutions), whereas employee and gross receipt thresholds are established for other categories. As discussed previously, the data available for this statewide assessment of OWTS regulations include employment data but do not include data on gross receipts for potentially affected industrial sectors. Therefore, relevant employee thresholds from California Government Code Section 11342.610 were used to identify the number of small businesses in industrial sectors, including a threshold of 250 employees for manufacturing enterprises.

Because California Government Code Section 11342.610 did not provide employment thresholds for other sectors relevant to this study, eligibility requirements set forth by the California Department of General Services (DGS) for small business certification were used to establish thresholds for other sectors. According to DGS's small business certification eligibility requirements, a small business is one that is independently owned and operated, not dominant in

[1] The California Trade and Commerce Agency has since been disbanded.

its field of operation, has its owners and principal office located in California, and must be a business with fewer than 100 employees and have average annual gross receipts of $10 million or less over the previous three tax years. For the purposes of this study, the 100-employee threshold was used to identify the number of small businesses in non-manufacturing industrial sectors.

The thresholds used for specific sectors are shown in Tables 4, 5, and 6.

Table 4. Selected Statistics for Potentially Affected Industries in California in 2004

NAICS Code	Industry Category	Relevant Industries Included in Category	Small Business Threshold (employees)	Number of Businesses	Number of Small Businesses	Total Employment	Total Payroll (1,000)
238910	Site preparation contractors	Septic tank contractors and installation	<100[1]	2,553	2,514	28,002	$1,290,960
326199	All other plastics products manufacturing	Septic tanks, plastics or fiberglass, manufacturing	<250[2]	893	868	40,506	$1,427,917
423320	Brick, stone, and related construction material merchant wholesalers	Septic tanks, concrete, merchant wholesalers	<100[1]	441	435	5,007	$225,153
423390	Other construction material merchant wholesalers	Septic tanks (except concrete) merchant wholesalers	<100[1]	317	312	4,408	$197,886
541380	Testing laboratories	Biological, environmental, pollution, and soil testing laboratories and services	<100[1]	814	797	13,377	$686,714
562991	Septic tank and related services	Septic tank cleaning and pumping services	<100[1]	192	188	2,676	$90,590

Notes: Data presented in this table do not include businesses with no paid employees.
[1] Threshold based on California Department of General Services small business certification eligibility requirements.
[2] Threshold based on small business definition in California Government Code section 11342.610.

Source: U.S. Census Bureau 2006b.

Table 5. Selected Statistics for Potentially Affected Industries in Los Angeles County in 2004

NAICS Code	Industry Category	Relevant Industries Included in Category	Small Business Threshold (employees)	Number of Businesses	Number of Small Businesses	Total Employment	Total Payroll (1,000)
238910	Site preparation contractors	Septic tank contractors and installation	<100[1]	367	362	4,067	$154,698
326199	All other plastics products manufacturing	Septic tanks, plastics or fiberglass, manufacturing	<250[2]	250	242	12,238	$409,966
423320	Brick, stone, and related construction material merchant wholesalers	Septic tanks, concrete, merchant wholesalers	<100[1]	117	117	1,171	$51,903
423390	Other construction material merchant wholesalers	Septic tanks (except concrete) merchant wholesalers	<100[1]	92	89	1,511	$58,276
541380	Testing laboratories	Biological, environmental, pollution, and soil testing laboratories and services	<100[1]	175	169	983	$143,433
562991	Septic tank and related services	Septic tank cleaning and pumping services	<100[1]	22	19	2,676	$30,860

Notes: Data presented in this table do not include businesses with no paid employees.
[1] Threshold based on California Department of General Services small business certification eligibility requirements.
[2] Threshold based on small business definition in California Government Code section 11342.610.

Source: U.S. Census Bureau 2006b.

Table 6. Selected Statistics for Potentially Affected Industries in Merced County in 2004

NAICS Code	Industry Category	Relevant Industries Included in Category	Small Business Threshold (employees)	Number of Businesses	Number of Small Businesses	Total Employment	Total Payroll (1,000)
238910	Site preparation contractors	Septic tank contractors and installation	<100[1]	24[3]	24[3]	127[3]	$6,983[3]
326199	All other plastics products manufacturing	Septic tanks, plastics or fiberglass, manufacturing	<250[2]	2	1	Not reported	Not reported
423320	Brick, stone, and related construction material merchant wholesalers	Septic tanks, concrete, merchant wholesalers	<100[1]	47[5]	47[5]	Not reported	Not reported
423390	Other construction material merchant wholesalers	Septic tanks (except concrete) merchant wholesalers	<100[1]	47[6]	47[6]	Not reported	Not reported
541380	Testing laboratories	Biological, environmental, pollution, and soil testing laboratories and services	<100[1]	12[7]	12[7]	114[7]	$5,567[7]
562991	Septic tank and related services	Septic tank cleaning and pumping services	<100[1]	10<[8]	10<[8]	Not reported	Not reported

Notes: Data presented in this table do not include businesses with no paid employees, except as noted.

[1] Threshold based on California Department of General Services small business certification eligibility requirements.

[2] Threshold based on small business definition in California Government Code section 11342.610.

[3] Data specific to site preparation contractors only is not available. Data shown here represents the "Other Specialty Contractors" sector, which includes site preparation contractors.

[4] Data was not reported due to the small number of businesses in this sector. According to the U.S. Census Bureau (2006c), this sector has fewer than 10 sole proprietor businesses in the "Fabricated Metal Product Manufacturing" sector, which includes metal tank (heavy gauge) manufacturing businesses.

[5] Data specific to brick, stone, and related construction material merchant wholesalers only is not available. Data shown here represents the "Other Durable Good Merchant Wholesalers" sector, which includes brick, stone, and related construction material merchant wholesalers.

[6] Data specific to other construction material merchant wholesalers only is not available. Data shown here represents the "Other Durable Good Merchant Wholesalers" sector, which includes other construction material merchant wholesalers.

[7] Data specific to testing laboratories only is not available. Data shown here represents the "Architectural, Engineering, and Related Services" sector, which includes testing laboratories.

[8] Data was not reported due to the small number of businesses in this sector. According to the U.S. Census Bureau (2006c), this sector has fewer than 10 sole proprietor businesses in the "Septic Tank and Related Services" sector.

Source: U.S. Census Bureau 2006b.

Current Fiscal Conditions Related to Regulating OWTS in California

This section describes current fiscal effects related to administering OWTS programs at the local and state level in California.

Local Agency Costs

Costs to local agencies for administering OWTS-related programs vary considerably, depending on the number and type of OWTS within a jurisdiction; local soil, geology, topography, and groundwater characteristics; water quality issues; local OWTS policies; and budget issues. Local programs can range from low-intensity permitting and oversight programs to high-intensity management programs that are often associated with jurisdictions with OWTS-related water quality problems and the use of non-conventional OWTS.

A 2004 report by the California Wastewater Training and Research Center at California State University, Chico, provided descriptions of six relatively progressive OWTS management programs of varying intensity in California. These programs are located in Santa Cruz County (including the San Lorenzo Watershed), Sonoma County, Stinson Beach (Marin County), The Sea Ranch (Sonoma County), the Town of Paradise (Butte County), and the Auburn Lakes Trails Subdivision (El Dorado County). Although these programs are not representative of typical local OWTS management programs throughout California, they do provide cost indicators for local programs that would be established in specific jurisdictions following implementation of the proposed OWTS regulations. The size, staffing, and costs of these six progressive local programs are summarized in Table 7.

Table 7. Summary of Progressive Local OWTS Management Programs

Jurisdiction	Number of OWTS	Number of Alternative OWTS in Use[1]	Agency Staffing Level for Program	Annual Cost of Program (Fiscal Year 2001-02)
Santa Cruz County	22,000 countywide; 13,000 in San Lorenzo Watershed	195 countywide; 137 in San Lorenzo Watershed	17 total staff members (11 full time, 6 part time)	$870,000 countywide, including $240,000 specific to the San Lorenzo Watershed
Sonoma County	45,000 countywide	2,204 (Year 2000)	3.4 staff (not including supervisory and management staff that are allocated as overhead)	$377,400 (for inspection and monitoring of alternative OWTS)
Stinson Beach (Marin County)	705 (estimated based on budget and fees)	NA	4 total staff (2 full time, 2 part time)	$281,800
The Sea Ranch (Sonoma County)	1,000	NA	5.2 staff	$193,400
Town of Paradise (Butte County)	11,118	61	4 staff (estimated based on 8,100 person-hours per year)	$281,300

Auburn Lakes Trail Subdivision (El Dorado County)	893	693	2.5 staff	NA

NA = not available.
Source: California Wastewater Training and Research Center, California State University, Chico, Chico Research Foundation, June 2004.
[1] In most cases, "Alternative OWTS" are similar to what is referred to as supplemental treatment systems or STS in this assessment.

The services provided by the six programs vary, but are generally fairly extensive. For example, at the upper end of the range, the Santa Cruz program provides the following services:

- planning, management oversight, and reporting to meet regional water quality control board requirements;
- parcel-specific data management;
- septage-receiving facility;
- water quality monitoring;
- parcel investigations for signs of system failure on the average on once every six years;
- public education;
- annual inspection and effluent monitoring of nonstandard systems;
- community sewer feasibility studies;
- evaluation and approval of proposed system designs;
- inspection of system installations; and
- low-interest loans for system upgrades.

The progressive OWTS management programs are generally funded by parcel fees. Examples of annual fees levied to fund the management programs include the following.

- Santa Cruz County
  -- countywide septic maintenance: $6.90/parcel per year
  -- San Lorenzo Watershed septic management: $18.54/parcel per year
  -- inspection and monitoring of nonstandard systems: $196/parcel per year for alternative systems; $98/parcel per year for nonconforming systems
- Sonoma County
  -- $83-$246/parcel per year, depending upon system inspection frequency
- Stinson Beach
  -- $355/residence per year
- The Sea Ranch
  -- $105/residence per year

Existing Regulatory Framework and State Water Board Staffing Needs for OWTS in California

Prospective owners of OWTS apply for permits from local agencies, including all 58 counties and a few cities and special districts. Most local agencies have adopted ordinances or regulations governing the siting and design of OWTS. Where ordinances have not been adopted, local

agency staff may rely on the California Plumbing Code. Local agency staff is typically funded from permit fees.

Each of the nine Regional Water Boards has adopted into its Basin Plans minimum siting and design requirements for OWTS for the protection of water quality. Because Basin Plans have the force of State regulations, local agency ordinances or regulations cannot be less stringent than requirements contained in the appropriate Basin Plan. In some cases, local OWTS regulations are more environmentally protective than those included in the basin plans. (See the regulatory comparison in Section 3.2, “Representative Regulations of Selected Local Governments and Regional Water Quality Control Boards” of the draft EIR for more information regarding existing OWTS regulations in California.)

The State Water Board proposes to adopt new statewide regulations for OWTS. Once adopted, OWTS may not be designed or installed in any manner that would be less restrictive than requirements contained in the regulations. The State Water Board also proposes to adopt a statewide waiver of WDRs. The statewide waiver parallels the requirements of the regulations but will be separately adopted. The waiver is intended to satisfy Section 13269 of the California Water Code and will provide a mechanism to allow the discharge of waste from certain OWTS, based on Regional Board basin plan criteria, without direct State oversight under the requirements of WDRs.

Since the 1970s, Regional Water Boards have formally or informally waived regulating most OWTS provided that the local agencies provided sufficient oversight to protect water quality. The exceptions are for OWTS serving multiple family residences and businesses, or where an OWTS serves multiple service connections. In those cases, most Regional Water Boards have issued individual WDRs.

There are currently no funds identified in the State budget for either State or Regional Water Board staff to regulate OWTS through a waiver program or for the regulations. During the 1970s and early 1980s, funding from the State General Fund was used to support State staff. From the mid-1980s, regulatory programs have been increasingly required to be entirely supported from fees. There has been a reluctance to initiate a fee on owners of OWTS for a number of reasons, including the fact that very few local agencies require OWTS owners to pay an annual fee. Therefore, most local agencies do not maintain databases of OWTS owners.

The State Water Board estimates that between 14 to 18 staff among the 13 State and Regional Water Board offices are necessary to carry out the current regulatory responsibilities related to OWTS.

ECONOMIC IMPACTS OF THE PROPOSED REGULATIONS

Compared to current conditions, the statewide number of OWTS in non-303(d) areas equipped with STS is expected to double by 2013 regardless of whether the Proposed Regulations are implemented. Under the Proposed Regulations, all existing OWTS within 600 feet of certain 303(d)-listed water bodies in California may have to be inspected and converted to STS within four years of a regulation-mandated inspection. In the worst-case scenario, all OWTS within 600 feet of certain 303(d)-listed areas would have to conform by installing supplemental treatment. (Note: There are certain exemption criteria but, for the purpose of this evaluation, it was assumed that all existing OWTS would be converted to STS.) (Such 303(d) water bodies are those where OWTS have been determined to be contributing to impairment and TMDLs have been adopted for the impaired water bodies.)

Households and businesses also must comply with proposed changes in requirements for operating, maintaining, and monitoring both existing and new OWTS. These effects, which differ depending on site-specific conditions, are as follows:

- For households with existing conventional OWTS, tank inspection is assumed to occur more often (i.e., on average once every 5 years instead of every 10 years), although the Proposed Regulations do not require inspection at an increased frequency. This would result in a doubling of OWTS maintenance requirements. (Note that the assumption that inspection would occur more often under the Proposed Regulations is a worst-case assumption; State Water Board staff expects that many OWTS would not be inspected so frequently.)

- All households and businesses with OWTS (conventional and STS) located on properties with onsite domestic wells would need to conduct groundwater sampling once every five years under the Proposed Regulations, a new requirement for OWTS users.

- For households and businesses with OWTS located within 600 feet of an impaired water body, a one-time groundwater level determination would be required by the Proposed Regulations for all new and existing OWTS. (Note that under existing conditions and no project conditions, a groundwater level determination is only required for new OWTS throughout the state.)

In addition, households and businesses with STS would have to comply with the following requirements under the Proposed Regulations:

- Households and businesses with STS would be required to have a maintenance contract with a qualified service provider. Additionally, STS operating costs are anticipated to be higher for most businesses, particularly for high-strength waste dischargers.

- Households and businesses with STS may need periodic effluent collection and testing, although this is not specifically required under the Proposed Regulations. The Proposed Regulations would require STS effluent collection and testing in accordance with STS O&M manuals, or more frequently if required by the local Regional Water Board.

- The Proposed Regulations would require households and businesses in areas with bacteria impairment that are using STS with disinfection to have weekly inspections of their systems by a service provider or to have a system equipped with telemetric monitoring.

The economic impacts of the Proposed Regulations focus on private-sector costs to households and businesses to implement the new regulations, and potential benefits related to water quality improvements and to increase spending on OWTS-related products and services by households and businesses. These effects are described in the following sections.

Private Sector Costs

This section describes OWTS-related private sector costs under current conditions, future no project conditions, and future Proposed Regulations conditions. The assessment of private-sector costs are largely driven by expected changes in the requirements for OWTS with STS, and for operating, maintaining, and monitoring the performance of OWTS.

The cost to households and businesses that must install new OWTS with STS and to convert conventional OWTS to STS would be substantial. Based on the unit cost estimates (Attachment A) developed for this assessment, the costs for installing an OWTS with STS are anticipated to range from $25,000-$45,000, compared to installation costs of $13,900-$23,300 for a conventional OWTS. For businesses that are high-strength waste dischargers on OWTS and do not require large-capacity/high-flow volume systems, the costs for installing an OWTS with STS would be much higher, ranging from $100,000-$400,000. (Note that these costs would apply to only high-strength waste dischargers that are replacing an existing OWTS or installing a new OWTS.)

In this section, the total statewide annual costs (Table 8) to households and businesses of the Proposed Regulations are compared to both the 2008 existing-conditions baseline and to the 2013 no-project baseline condition. Total costs for 303(d) areas are presented separately in Table 9. The assumptions incorporated into the cost analyses are described in the following methodology section.

Methods and Assumptions

Private sector costs for conditions under the existing baseline (2008), the future no-project baseline (2009-2013), and the Proposed Regulations (2009-2013) were estimated for California statewide, for the two case-study counties of Los Angeles and Merced, and for the areas within 600 feet of 303(d)-listed impaired water bodies. These estimates were developed based on projections of OWTS used by households and businesses, and on estimates of unit costs for installing, operating, maintaining, and monitoring OWTS under existing baseline, future baseline, and Proposed Regulations conditions.

Based on the estimated number of OWTS for 2008 and projected for 2013, assumptions were developed to allocate the number of OWTS to various categories that could be affected by the Proposed Regulations. These categories included conventional OWTS, OWTS with STS, conventional OWTS converted to STS, OWTS converted to high-strength STS, OWTS with disinfection, OWTS that would be newly installed over the 2009-2013 period, and OWTS that would be replaced over this period. Applicable unit costs were applied to the various categories of OWTS to arrive at total cost estimates for installing, operating, maintaining, and monitoring OWTS under existing baseline, future baseline, and Proposed Regulations conditions. For the future baseline and Proposed Regulations, accrued costs over the 2009-2013 period were then annualized by averaging the costs over this period and converting the annualized costs to present value using a 3 percent real (i.e., net of inflation) discount rate. Annual average costs estimated for the Proposed Regulations were compared to costs under existing baseline and future baseline conditions to determine the cost impacts of the Proposed Regulations in all geographic areas of interest.

As previously discussed, several assumptions were incorporated into the cost assessment, including assumptions that differ for existing baseline, future baseline, and Proposed Regulations conditions. Many of the assumptions apply to the cost assessment for both the non-303(d) areas (i.e., for the statewide cost assessment and the assessments in the case-study counties of Los Angeles and Merced) and the 303(d) areas, whereas others apply only to the cost assessment for the 303(d) areas. These assumptions are grouped separately in the following sections.

<u>Assumptions That Apply to All Geographic Areas</u>

- The *number of OWTS* (existing, new, and replaced) *with STS* used by households and businesses was assumed to be 1.0 percent of total OWTS in Merced County and statewide, and 0.25 percent in Los Angeles County for the 2008 existing baseline, and 2.0 percent of total OWTS in Merced County and statewide and 0.5 percent in Los Angeles County outside of 303(d) areas for 2013 conditions (future baseline and Proposed Project).

- The annual OWTS *replacement rate* for households and businesses was assumed to be one percent of total OWTS for the 2008 existing baseline and 2013 future baseline conditions, and was assumed to be two percent of total OWTS for the 2013 Proposed Regulations conditions.

- For 2008 existing baseline conditions, the number of new OWTS constructed in 2008 for household use was estimated by assuming that the OWTS growth rate in 2008 would be the same as the annual percentage change in OWTS growth between 2000 (1999 for the CSUC-based projections) and 2008, and the number of *new OWTS constructed in 2008 for business use* was estimated by assuming that the OWTS growth rate in 2008 would be the same as the average annual percentage change in overall business growth between 1994 and 2004, as reported in County Business Patterns reports. (Note: the total number of OWTS in place in 2008 was estimated using methods described in the background section of this report.)

- For 2013 future baseline and Proposed Regulations conditions in all areas (non-303(d) and 303(d) areas), household and business OWTS with *onsite domestic wells* were assumed to represent 50 percent of total OWTS.

- For 2013 Proposed Regulations conditions, it was assumed that households and businesses with STS may face costs for *periodic effluent collection and testing*, although this is not required under the Proposed Regulations. The Proposed Regulations would require STS effluent collection and testing in accordance with STS O&M manuals, or more frequently if required by the local Regional Water Board. Quarterly testing is the most common requirement at the local and regional levels (Bradley, pers. comm., 2007), so the cost analysis assumed that quarterly STS testing would occur under the Proposed Regulations. (Note: It was assumed that businesses would also be required to conduct quarterly testing under 2008 existing baseline conditions.)

- For 2013 Proposed Project conditions, it was assumed that 20 percent of STS statewide would have *disinfection*, requiring weekly inspections or remote telemetric monitoring. Of STS with disinfection, it was assumed that 80 percent of these systems would be equipped with telemetric monitoring equipment, with the remainder subject to weekly inspections by a service provider.

Assumptions Specific to 303(d) Areas

- The rate of STS usage in 303(d) areas under 2008 existing baseline and 2013 future baseline conditions was assumed to be the same as in non-303(d) areas (i.e., 1 percent of OWTS in 2008, 2 percent of OWTS in 2013).

- For 2013 Proposed Regulations conditions, it was assumed that 100 percent of OWTS within 600 feet of 303(d) area water bodies would convert to STS within four years of an inspection that is required to occur within one year of the regulations going into effect, as required by the Proposed Regulations.

- Per Item D of the 303(d) section of the Proposed Regulations, the San Lorenzo River, Sonoma Creek, Napa River, and Tomales Bay watersheds meet the criteria for an exemption from the regulations and are assumed to be unaffected by the regulations.

- For 2013 Proposed Regulations conditions, a groundwater level determination (a one-time $1,250 cost) would be required for existing and new OWTS for households and businesses within 600 feet of an impaired water body.

Table 8. Summary of Cost Impacts on Households and Businesses in Los Angeles County, Merced County, and California (in millions of dollars)

Area	Annual Costs in 2008[a]	2013 No Project Costs				2013 Proposed Regulations Costs						
		Total 2009-2013 Costs		Annualized Costs (in Present Value)		Total 2009-2013 Costs		Annualized Costs (in Present Value)		Change in Costs Relative to No Project Conditions		
										Total 2009-2013 Increase in Costs		Average Annual Increase in Costs
		Nominal Costs	Present Value	Average Annual	Increase from 2008	Nominal Costs	Present Value	Average Annual	Increase from 2008	Nominal Costs	Present Value	
Census-Based Household Projections/High-Range Statewide Business Projections												
Los Angeles County:												
Households	$35.4	$229.3	$210.0	$42.0	$6.6	$415.0	$380.2	$76.0	$40.6	$185.7	$170.1	$34.0
Businesses	$0.83	$4.2	$3.8	$0.76	-$0.07[c]	$41.9	$38.3	$7.7	$6.8	$37.7	$34.5	$6.9
Total	$36.2	$233.5	$213.8	$42.8	$6.5	$456.9	$418.5	$83.7	$47.4	$223.4	$204.6	$40.9
Merced County:												
Households	$6.4	$43.9	$40.2	$8.0	$1.6	$62.3	$57.1	$11.4	$5.0	$18.4	$16.9	$3.4
Businesses	$0.06	$0.32	$0.29	$0.06	-$0.01[c]	$4.8	$4.4	$0.9	$0.8	$4.5	$4.1	$0.8
Total	$6.5	$44.2	$40.5	$8.1	$1.6	$67.1	$61.5	$12.3	$5.8	$22.9	$21.0	$4.2
California[b]:												
Households	$501.5	$3,427.3	$3,139.2	$627.8	$126.3	$4,867.9	$4,458.7	$891.7	$390.2	$1,440.6	$1,319.5	$263.9
Businesses	$9.1	$48.4	$44.4	$8.9	-$0.21[c]	$462.3	$423.4	$84.7	$75.6	$413.8	$379.0	$75.8
Total	$510.6	$3,475.7	$3,183.6	$636.7	$126.1	$5,330.2	$4,882.1	$976.4	$465.8	$1,854.4	$1,698.5	$339.7
CSUC-Based Household Projections/Low-Range Statewide Business Projections												
Los Angeles County:												
Households	$32.6	$217.8	$199.5	$39.9	$7.3	$373.2	$341.9	$68.4	$35.8	$155.4	$142.3	$28.5
Businesses	$0.83	$4.2	$3.8	$0.76	-$0.07[c]	$41.9	$38.3	$7.7	$6.8	$37.7	$34.5	$6.9
Total	$33.4	$222.0	$203.3	$40.7	$7.2	$415.1	$380.2	$76.1	$42.6	$193.1	$176.8	$35.4
Merced County:												
Households	$6.2	$43.4	$39.8	$8.0	$1.8	$61.7	$56.5	$11.3	$5.1	$18.3	$16.7	$3.3
Businesses	$0.06	$0.32	$0.29	$0.06	-$0.01[c]	$4.8	$4.4	$0.9	$0.8	$4.5	$4.1	$0.8
Total	$6.3	$43.7	$40.1	$8.1	$1.8	$66.5	$60.9	$12.2	$5.9	$22.8	$20.8	$4.1
California[b]:												
Households	$493.6	$3,481.2	$3,188.5	$637.7	$144.1	$4,944.4	$4,528.8	$905.8	$412.1	$1,463.2	$1,340.2	$268.0
Businesses	$2.2	$12.1	$11.1	$2.2	-$0.007	$115.8	$106.1	$21.2	$19.0	$103.7	$95.0	$19.0
Total	$495.8	$3,493.3	$3,199.6	$639.9	$144.1	$5,060.2	$4,634.9	$927.0	$431.1	$1,566.9	$1,435.2	$287.0

Notes:

[a] Costs in 2008 include annualized inspection costs related to normal maintenance of existing OWTS; and design, siting, and installation costs for new and replaced OWTS in 2008.

[b] Projected statewide costs are assumed to implicitly include effects in 303(d) areas. Although effects in 303(d) were estimated separately from statewide effects, these effects are assumed to be included in the overall statewide effects.

[c] Negative cost changes are artifacts of the mathematical calculations used to convert small cost increases to present value dollars.

Table 9. Summary of Cost Impacts on Households and Businesses in 303(d) Areas (in millions of dollars)

Area	Annual Costs in 2008[a]	2013 No Project Costs				2013 Proposed Regulations Costs						
		Total 2009-2013 Costs		Annualized Costs (in Present Value)		Total 2009-2013 Costs		Annualized Costs (in Present Value)		Change in Costs Relative to No Project Conditions		
		Nominal Costs	Present Value	Average Annual	Increase from 2008	Nominal Costs	Present Value	Average Annual	Increase from 2008	Total 2009-2013 Increase in Costs: Nominal Costs	Total 2009-2013 Increase in Costs: Present Value	Average Annual Increase in Costs
Malibu Creek:												
Households	$0.106	$0.542	$0.497	$0.099	-$0.006[b]	$54.589	$50.001	$10.000	$9.895	$54.047	$49.504	$9.901
Businesses	$0.001	$0.005	$0.005	$0.001	$0.000	$0.749	$0.686	$0.137	$0.136	$0.744	$0.681	$0.136
Total	$0.107	$0.547	$0.502	$0.100	-$0.006[b]	$55.338	$50.687	$10.137	$10.031	$54.791	$50.185	$10.037
Northern Santa Monica Bay Beaches:												
Households	$0.631	$4.020	$3.682	$0.736	$0.105	$114.656	$105.019	$21.004	$20.372	$110.637	$101.337	$20.267
Businesses	$0.005	$0.028	$0.026	$0.005	$0.000	$1.457	$1.334	$0.267	$0.262	$1.429	$1.309	$0.262
Total	$0.636	$4.048	$4.339	$0.741	$0.105	$116.113	$106.353	$21.271	$20.634	$112.066	$102.646	$20.529
Santa Clara River:												
Households	$0.081	$0.641	$0.587	$0.117	$0.037	$12.476	$11.427	$2.286	$2.205	$11.835	$10.840	$2.168
Businesses	$0.001	$0.006	$0.006	$0.001	$0.000	$0.218	$0.200	$0.040	$0.039	$0.212	$0.194	$0.039
Total	$0.082	$0.647	$0.593	$0.118	$0.037	$12.694	$11.627	$2.326	$2.244	$12.050	$11.034	$2.207
Canyon Lake:												
Households	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000
Businesses	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000
Total	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000
Lake Elsinore:												
Households	$0.013	$0.085	$0.078	$0.016	$0.002	$2.079	$1.905	$0.381	$0.367	$1.994	$1.826	$0.365
Businesses	$0.002	$0.011	$0.010	$0.002	$0.000	$0.274	$0.251	$0.050	$0.048	$0.263	$0.241	$0.048
Total	$0.015	$0.096	$0.088	$0.018	$0.002	$2.353	$2.156	$0.431	$0.415	$2.257	$2.067	$0.413
Rainbow Creek:												
Households	$0.068	$0.508	$0.465	$0.093	$0.025	$12.350	$11.312	$2.262	$2.194	$11.843	$10.847	$2.169
Businesses	$0.001	$0.016	$0.014	$0.003	$0.002	$0.513	$0.470	$0.094	$0.093	$0.497	$0.456	$0.091
Total	$0.069	$0.524	$0.479	$0.096	$0.027	$12.863	$11.782	$2.356	$2.287	$12.340	$11.303	$2.260
Totals for 303(d) Areas:												
Households	$0.899	$5.796	$5.309	$1.061	$0.160	$196.194	$179.664	$35.933	$35.033	$190.356	$174.354	$34.870
Businesses	$0.010	$0.066	$0.061	$0.012	$0.002	$3.211	$2.941	$0.59	$0.578	$3.145	$2.881	$0.576
Total	$0.909	$5.862	$5.370	$1.073	$0.162	$199.405	$182.605	$36.521	$35.611	$193.501	$177.235	$35.446

Notes:

[a] Costs in 2008 include annualized inspection costs related to normal maintenance of existing OWTS; and design, siting, and installation costs for new and replaced OWTS in 2008.

[b] Negative cost changes are artifacts of the mathematical calculations used to convert small cost increases to present value dollars.

- For 2013 Proposed Regulations conditions, all OWTS with STS in the Malibu Creek and Northern Santa Monica Bay Beaches 303(d) areas would have disinfection and would be required to have weekly inspections or to be equipped with telemetric monitoring equipment due to bacteria impairment. For all other 303(d) areas, it was assumed that 20 percent of STS OWTS would have disinfection and would therefore be subject to weekly inspections or remote telemetric monitoring.

Baseline Conditions

Unit Costs

For a typical household on OWTS in 2008, costs would include tank inspection, which is estimated to range from $150-$500 per inspection. Assuming homeowners have their tanks inspected once every 10 years, these costs would range from $15-$50 on an annual basis, with a mid-point cost of $33 per year.

For a typical property owner installing a new conventional OWTS, the design, siting, and installation costs are estimated to range from $13,900-$23,300, with a mid-point cost of $18,600. For a household replacing a conventional OWTS with another conventional OWTS, costs are estimated to be about $9,700. Additionally, for a household installing a new OWTS, a one-time groundwater level determination is required by the Uniform Plumbing Code. This cost is estimated to range from $1,000 to $1,500, with a mid-point cost of $1,250.

For a typical business using OWTS in 2008, costs are anticipated to be at the upper end of the cost range for households, with annual tank inspection costs of $50, and OWTS baseline design, siting, and installation costs of $23,300. A groundwater level determination is estimated to cost the same as for households ($1,250). For businesses with STS, effluent collection and testing is assumed to be required on a quarterly basis. Costs are estimated to range from $800-$1,800, with a mid-point cost of $1,300.

Unit costs for typical households and businesses under No Project conditions are assumed to be the same as under 2008 existing conditions.

Total Costs

Existing Baseline Conditions (2008). For all geographic areas of interest, a cost for 2008 was estimated to provide an existing-conditions baseline for the analysis. The 2008 costs are the annualized inspection costs related to normal maintenance of existing OWTS, and the design, siting, and installation costs for new OWTS constructed in 2008 and for those OWTS that would be replaced during that year.

Statewide. Annual costs statewide in 2008 are estimated to range from $495.8 million to $510.6 million, with households accounting for more than 98 percent of total costs (Table 8). Businesses using OWTS, which are estimated to account for a small percentage of OWTS users

statewide, are estimated to face annual costs ranging from $2.2 million to $9.1 million under existing conditions.

Case Study Counties. Costs in 2008 in the case-study counties of Los Angeles and Merced vary substantially due primarily to the differences in their population sizes and the number of OWTS being used in each county. As Table 8 shows, annual costs in Los Angeles County are estimated to range from $33.4 million to $36.2[*] million in 2008. In Merced County, annual costs are estimated to range from $6.3 million to $6.5 million. In both counties, costs would be borne primarily by households using OWTS (about 98 percent in both Los Angeles and Merced counties).

303(d) Areas. For the estimated 2,798 households and businesses within 600 feet of impaired water bodies in California subject to the Proposed Regulations, annual OWTS-related costs are estimated to total about $910,000 in 2008, with households accounting for an estimated 99 percent of the costs (Table 9). These estimated costs include annualized inspection costs related to normal maintenance of existing OWTS; and design, siting, and installation costs for new and replaced OWTS in 2008. Among the 303(d) areas with OWTS users, annual costs in 2008 are estimated to range from $15,000 for the estimated 35 OWTS users in the Lake Elsinore 303(d) area to $636,000 for the estimated 1,563 OWTS users in the Northern Santa Monica Bay Beaches 303(d) area (Table 9).

Future Baseline Conditions (2013). Under No Project conditions, costs for normal maintenance and design/siting/installation of new and replaced OWTS were developed over the 2009-2013 period, with differences from 2008 baseline costs largely attributable to the population-driven growth in OWTS use over that period and by the assumed increase in STS usage by 2013.

Statewide. Statewide OWTS-related costs accumulating over the 5-year (2009-2013) period are projected to total about $3.2 billion under future baseline conditions (Table 8). When annualized over this period, costs are projected to range from $637 million to $640 million for households and businesses in California, with household OWTS users accounting for about 99 percent of the costs. Annual statewide costs over the 2009-2013 period are projected to be about 25-29 percent higher than costs in 2008.

Case Study Counties. In the case-study counties, cumulative OWTS-related costs over the 5-year period are projected to range from $203.3 to $213.8 million in Los Angeles County and from $40.1 to $40.5 million in Merced County under future baseline conditions (Table 8). Annual costs over this period for households and businesses are projected to range from $40.7 to $42.8 million in Los Angeles County and to average about $8.1 million in Merced County. Relative to costs in 2008, annual costs over the 2009-2013 period are projected to increase by about 18-22 percent in Los Angeles County and by about 25-29 percent in Merced County.

[*] These costs are (1) a sum of annualized midpoint costs of inspecting septic tanks, and (2) an estimate of new and replaced units multiplied by the mid-point cost of constructing new and replaced OWTS (including a small number of STS).

303(d) Areas. Under future baseline conditions, OWTS-related costs across all 303(d) areas are projected to cumulatively total $5.4 million over the 2009-2013 period (Table 9). On an annual basis, these costs would be about $1.1 million, representing an 18 percent increase over 2008 costs. Among the 303(d) areas with OWTS users, annual costs over the 5-year period are projected to be highest in the northern Santa Monica Bay beach area at $741,000 and lowest in the Lake Elsinore area at $18,000. As Table 9 shows, differences in annual costs relative to 2008 for OWTS users in other 303(d) areas would be minor.

Proposed Regulations

Unit Costs

Under the Proposed Regulations condition, unit costs for households with existing conventional OWTS would be the same as under existing conditions, with three exceptions. First, although the Proposed Regulations do not require inspection at an increased frequency, tank inspection is assumed to occur twice as often (i.e., on average once every 5 years), resulting in annual costs ranging from $30-$100, with a midpoint cost of $65, compared to $33 under existing conditions. (Note that the assumption that inspection would occur more often under the Proposed Regulations is a worst-case assumption; State Water Board staff expects that many OWTS would not be inspected so frequently.) Second, all households with OWTS (conventional and STS) located on properties with onsite domestic wells would incur groundwater sampling costs once every five years. Groundwater sampling and testing costs are estimated to range from $200-$450, or $40-$90 (with a mid-point cost of $65) when annualized over five years. Third, a one-time groundwater level determination would be required for all new and existing OWTS located within 600 feet of an impaired water body, with a mid-point cost of $1,250. (Note that under existing conditions and no project conditions, a groundwater level determination is only required for new OWTS throughout the state.)

For a typical property owner installing a new OWTS with STS under the Proposed Regulations, the design, siting, and installation costs are estimated to range from $25,000-$45,000, with a mid-point cost of $35,000, compared to $18,600 for a conventional OWTS. For a household replacing a conventional OWTS with an OWTS with STS, costs are estimated to range from $30,000-$60,000, with a mid-point cost of $45,000.

In addition to higher design, siting, and installation costs, households with STS would also face higher ongoing costs under the Proposed Regulations for a maintenance contract with a service provider. The cost of an STS maintenance contract is estimated to range from $400-$1,000 annually, with a mid-point cost of $700. Additionally, households with STS may face costs for periodic effluent collection and testing, although this is not specifically required under the Proposed Regulations. However, the Proposed Regulations would require STS effluent collection and testing in accordance with STS O&M manuals, or more frequently if required by the local Regional Water Board. Quarterly testing is the most common requirement at the local and regional levels (Bradley, pers. comm., 2007), so the cost analysis assumed that quarterly STS testing would occur under the Proposed Regulations. Effluent collection and testing costs are estimated to range from $200-$450 per occurrence, or from $800-$1,800 per year for quarterly testing, with a mid-point cost of $1,300. Finally, the Proposed Regulations would require

households in areas with bacteria impairment that are using STS with disinfection, which are assumed to include 20 percent of all STS statewide, to have weekly inspections of their systems by a service provider or to have a system equipped with telemetric monitoring. Weekly inspections are estimated to cost $150, or $7,800 annually (Bradley, pers. comm., 2007); telemetric monitoring is estimated to cost $740 annually.

For a typical business using a conventional or STS OWTS under the Proposed Regulations, costs are anticipated to be the same as those for households, with the exception of tank inspection costs, which are estimated at $100 when annualized over 5 years; and annual operating costs for STS business users, which are estimated to range from $4,000-$11,000, with a mid-point cost of $7,500.

For businesses that are high-strength waste dischargers on OWTS that do not require large-capacity/high-flow volume, systems may be required to add supplemental treatment under the Proposed Regulations. Restaurants would be the major type of business affected by this proposed requirement (Bradley, pers. comm., 2007). Costs for designing, siting, and installing a high-strength OWTS with STS are estimated to range from $100,000-$400,000, with a mid-point cost of $250,000. These high-strength systems would also generate higher annual operating costs to business users. Annual operating costs for high-strength STS systems are estimated to range from $10,000-$15,000, with a mid-point cost of $12,500.

Potential Funding Source for OWTS Owners. As stated in Assembly Bill (AB) 885, it was the intent of the California Legislature to offer financial assistance to existing OWTS owners who incur costs as a result of the new statewide regulations required by AB 885. Included as Section 13291.5, AB 885 states:

> "It is the intent of the legislature to assist private property owners with existing systems who incur costs as a result of the implementation of the regulations established under this section by encouraging the state board to make loans under Chapter 6.5 (commencing with Section 13475) to local agencies to assist private property owners whose cost of compliance with these regulations exceeds one-half of one percent of the current assessed value of the property on which the onsite sewage system is located."

The funding source referred to in AB 885 is the 1987 State/Federal EPA Clean Water Program modification to the Clean Water Act, which created the State Revolving Fund (SRF). The SRF is the major funding source available to help existing OWTS owners. It is funded by Federal Capitalization Grants that are matched by the State. The State uses the SRF to make low-interest loans for water pollution abatement and must make loans to a public, special district, city, town or conservation organization. While the amount of available money fluctuates from year to year, typically, the SRF has available $200 to $300 million to loan on an annual basis. Financing is for 20-year periods with an interest rate equal to one-half the current State General Obligation Bond Rate, usually ranging from 2.5 to 3.5 percent. In addition, the State Water Board is exploring extended terms and reduced interest rate financing to further address disadvantaged communities.

Total Costs

Under the Proposed Regulations condition, costs were projected over the 2009-2013 period, totaled, converted to present value, and annualized. These costs include those under No Project conditions, but also include additional costs related to the Proposed Regulations, including groundwater sampling from a domestic water or monitoring well, OWTS maintenance contracts with service providers for STS, weekly system inspection or telemetric monitoring (for STS with disinfection only), and possibly collecting and testing effluent samples for STS. (Note: As previously discussed, the Proposed Regulations would not require STS effluent collection and testing; however, the cost analysis assumed that quarterly STS testing would occur under the Proposed Regulations.) For businesses, additional costs for the Proposed Regulations include more expensive installation and maintenance costs for STS for high-strength effluent producers. The assumed replacement rate for OWTS is also higher under the Proposed Regulations, resulting in additional costs for both businesses and households.

Statewide. Cumulative costs to OWTS users statewide over the 5-year (2009-2013) analysis period are projected to range from $4.6 billion to $4.9 billion with implementation of the Proposed Regulations (Table 8). These cumulative costs are projected to be from $1.4 billion to $1.7 billion higher than costs over the same period under future baseline conditions, an increase ranging from 45 to 53 percent. Households would incur the largest share of these costs (91-98 percent) over the 5-year period; however, businesses are projected to experience a larger percentage increase in costs, with costs increasing by more than 800 percent over this period, in large part due to OWTS installation, operations, and maintenance costs for high-strength waste dischargers that may be required to add supplemental treatment.

Annualized costs statewide over the 5-year analysis period to households and businesses to implement the Proposed Regulations would increase from about $637-$640 million under future baseline conditions to about $927-$976 million under the Proposed Regulation, an increase ranging from $287.0 million to $339.7 million. These annual costs would be 45 to 53 percent higher than under future baseline conditions.

Case Study Counties. In Los Angeles County, cumulative costs to OWTS users are projected to increase by $176.8-$204.6 million, or by 87-96 percent, over the 2009-2013 under the Proposed Regulations (Table 8). Annualized costs are projected to increase by about $35-$41 million under the Proposed Regulations.

Cumulative costs to OWTS users in Merced County are projected to increase by about $21.0 million, or by 52 percent, over the 2009-2013 under the Proposed Regulations. Annualized costs are projected to increase by about $4.2 million under the Proposed Regulations.

303(d) Areas. Cumulative costs over the 5-year (2009-2013) analysis period in 303(d) areas are projected to total $182.6 million, an increase of $177.2 million over costs under future baseline conditions (Table 9). Annualized costs in 303(d) areas over the 5-year analysis period are projected to increase from $1.1 million under future baseline conditions to $36.5 million under the Proposed Regulations, a $35.4 million increase in costs to households and businesses.

The annualized cost increase solely attributable to household OWTS users is projected to increase by $34.9 million, compared to an increase of $576,000 for businesses.

Among the 303(d) areas that could be affected by the Proposed Regulations, the largest annualized cost increase is projected to occur in the northern Santa Monica Bay beach area ($20.5 million) and the Malibu Creek watershed area ($10.0 million). For the remaining 303(d) areas, increases in annual costs relative to future baseline conditions are projected to range from $413,000 to $2.3 million (Table 9).

Sensitivity Analysis

The costs of implementing the Proposed Regulations are largely driven by three categories of factors: 1) the specific OWTS requirements for households and businesses imposed by the Proposed Regulations (e.g., households and businesses with STS would be required to have a maintenance contract with a qualified service provider); 2) the average unit costs for installing, operating, maintaining, and monitoring different categories of OWTS; and 3) the distribution of existing and future numbers of OWTS among the various categories of OWTS users potentially affected by the Proposed Regulations (e.g., conventional OWTS, OWTS with STS, new OWTS, replaced OWTS).

The sensitivity analysis conducted for this study focused on evaluating the effects of changes in assumptions in the third category of factors because distributing the existing and projected numbers of OWTS among different categories of OWTS users required developing key assumptions that have substantial effects on the projected costs. Conversely, the specific requirements of the Proposed Regulations would vary only with implementing different sets of Proposed Regulations, and the unit costs, which were developed with the input of OWTS professionals, would vary according to cost factors largely external to implementation of the Proposed Regulations.

To assess the sensitivity of alternative assumptions about the distribution of OWTS, costs were recalculated independently for changes in the following three key assumptions.

- The percentage of total OWTS that would be equipped with STS under 2013 with- and without-project conditions, which was assumed to be 2 percent, was tested by evaluating percentages of 1 percent and 3 percent.

- The annual OWTS replacement rate under 2013 with-project conditions, which was assumed to be 2 percent, was tested by evaluating future replacement rates of 1 percent and 3 percent.

- The OWTS inspection rate under with-project conditions, which was assumed to be once every 5 years, was tested by evaluating an inspection rate of once every 10 years.

Table 10 shows the results of varying these three key assumptions. As shown, variation in any of the three key assumptions results in relatively large changes in the projected total annual costs to households of implementing the Proposed Regulations, relative to costs under 2008 existing

baseline and 2013 future baseline conditions. (The sensitivity of costs to businesses of varying the assumptions would be similar to those for households.) The regional impacts, including employment effects, projected for the Proposed Regulations would also be sensitive to changes in these key assumptions because the private-sector costs are the primary inputs to the regional economic impact analysis.

In summary, the sensitivity analysis clearly suggests that assumptions developed for the private-sector cost analysis play a major role in determining the magnitude of the cost impacts of implementing the Proposed Regulations. Additionally, the sensitivity analysis indicates that should future rates of STS usage, replacement of OWTS, or inspection of OWTS significantly change from the rates assumed for the private-sector cost analysis, the costs of implementing the Proposed Regulations could be substantially higher or lower than those presented in this report.

Table 10. Sensitivity of Statewide Household-Related Costs of Implementing the Proposed Regulations to Variation in Key Assumptions

	Cost of Proposed Regulations Relative to 2008 Existing Conditions		Cost of Proposed Regulations Relative to 2013 Without-Project Conditions	
Cost Scenario	**Annualized Cost Increase (millions)**	**Percentage Change from Cost Projection**	**Annualized Cost Increase (millions)**	**Percentage Change from Cost Projection**
Projected cost of implementing the Proposed Regulations[1]	$390.2	NA	$263.9	NA
Variation in the assumed STS usage rate[2]:				
1% STS rate	$307.2	-21.3%	$226.4	-14.2%
3% STS rate	$464.0	+18.9%	$292.2	+10.7%
Variation in the assumed OWTS replacement rate[3]:				
1% replacement rate	$268.6	-31.2%	$142.3	-46.1%
3% replacement rate	$511.8	+31.2%	$385.5	+46.1%
Variation in the OWTS inspection rate[4]:				
Once every 10 years	$348.1	-10.8%	$221.8	-16.0%

Notes:
NA = not applicable.

[1] the annualized present-value statewide costs to households projected for implementation of the Proposed Regulations based on assumptions and other factors developed for this report's private-sector cost assessment. (See Table 8: Costs for Census-based household projects.)

[2] For the private-sector cost assessment, it was assumed that 2 percent of all OWTS would by STS under 2013 with- and without-project conditions.

[3] For the private-sector cost assessment, it was assumed that the OWTS replacement rate would be 2 percent under 2013 with-project conditions.

[4] For the private-sector cost assessment, it was assumed that all OWTS would be inspected, on average, once every 5 years instead of once every 10 years under 2013 with-project conditions.

Water Quality Benefits

This analysis of water quality benefits focuses on assessing the types and potential magnitude of benefits expected to result from implementing the Proposed Regulations. The term "economic benefits" refers to the dollar value associated with expected positive outcomes caused by the Proposed Regulations that lead to increased social welfare. The relevant measures of social welfare are expected changes in consumer and producer surplus. These "surplus" concepts are standard and widely accepted measures of value in applied economics welfare analysis, and reflect the degree of economic well-being resulting from a policy action.

For analyzing water quality benefits, benefits are typically categorized according to whether or not they involve some form of direct use of, or contact with, affected water bodies. Use benefits can include both direct and indirect uses of impacted waters, such as effects on human health and recreation values. Enhanced environmental conditions from improved water quality also can be valued by individuals apart from any past, present or expected future use of a resource. These types of values are referred to as nonuse (or passive use) values, and include values associated with individuals' willingness to pay for some type of environmental improvement. Motivations for such values typically involve concepts of existence, bequest, and stewardship values.

Aquatic ecosystems and underground aquifers provide a wide range of use and nonuse benefits. From a state policy perspective, these benefits are characterized in terms of "beneficial uses" that are supported by achieving water quality objectives. The Regional Water Boards are charged with protecting these uses from pollution and nuisance that result from point and nonpoint sources, including OWTS. This analysis of water quality benefits characterizes important beneficial uses affected by contaminants from OWTS and evaluates the expected change in economic benefits associated with water quality improvements from implementing the Proposed Regulations.

Methods and Assumptions

Water quality benefits are assessed in terms of potential changes in the value of beneficial uses affected by OWTS contaminants. OWTS release pathogenic organisms and nutrients that can contribute to pollution of groundwater resources and surface waters, resulting in the listing of surface water bodies on the 303(d) list (i.e., waters that do not meet applicable water quality standards with technology-based controls alone). Wastewater from OWTS contains bacteria, virus and other microorganisms that have the potential to cause diseases, such as hepatitis, typhoid, and salmonella-related diseases, and dysentery. Effluent from OWTS that are not functioning properly or that provide incomplete treatment may enter streams or groundwater, thereby providing a human health hazard and rendering water unsafe for drinking or swimming. Beneficial uses that can be adversely affected by pathogens include municipal and domestic water supplies (MUN) and water contact and noncontact water recreation (REC1 and REC2).

Nutrients from OWTS include nitrates and phosphorous. Excessive levels of nitrates in groundwater can make water unsafe for drinking. When excessive levels of both nutrients reach surface waters, it can stimulate the growth of algae, fungi, and other primary organisms. Excessive stimulation of biological growth can disrupt stream ecosystems, reduce dissolved

oxygen levels, create unsightly and nuisance growths of algae, and impart nuisance tastes and odors to the water that can increase treatment costs for water supply (according to the San Lorenzo River Watershed study [County of Santa Cruz 1989]). Beneficial uses that can be adversely affected by excessive nutrients include water contact and noncontact water recreation (REC1 and REC2), municipal and domestic water supplies (MUN), and fish and wildlife habitat (WARM, COLD, and WILD).

Potential changes in the value of beneficial uses affected by OWTS contaminants are assessed below using inferences about economic values from other studies that assess the economic costs and benefits of water quality conditions in California. Three studies that are particularly relevant for the assessment are:

- The Southern California Beach Valuation Project, a multi-agency effort initiated by NOAA for the purpose of estimating market and nonmarket values of recreation uses of Southern California beaches;

- Estimating the Economic Burden from Illnesses Associated with Recreational Coastal Water Pollution – a case study in Orange County, California, published in 2005 in the Journal of Environmental Management; and

- Economic Analysis of the Proposed California Water Quality Toxics Rule, prepared in 1997 by the U.S. Environmental Protection Agency.

These studies explicitly consider the effects of changes in water quality conditions on economic values. For the Southern California Beach Valuation Project, the benefits analysis focused on the valuation of beach days associated with improved water quality conditions. For the Economics Burden from Illnesses study, the assessment estimated the health costs from exposure to bacteria in the marine environment. For the California Toxics Rule study, the benefits analysis focused on valuation of reducing human health risks associated with fish consumption, improving recreational angling opportunities, and nonuse (passive use) values.

Proposed Regulations

As described in the Water Quality and Public Health section of the draft EIR (Section 4), improvement in surface and groundwater quality from implementing the Proposed Regulations is expected, most notably in 303(d) areas where OWTS are contributing to impairment, and more generally throughout the state where OWTS are and will be located. The improvements to water quality are expected to have the following effects related to beneficial uses:

- reduce the number of beach closures and advisories due to high bacterial levels in 303(d) impaired water bodies, where OWTS are major contributors to impairment

- reduce public health costs from contact with high levels of bacteria and other micro-organisms during water contact recreation activity,

- reduce the costs of treatment for nitrates and other pollutants in drinking water supplies at private wells, and in some cases, at centralized treatment plants, and

- by reducing the amount of nutrients entering surface water bodies, reduce excessive levels of algae that could impair fish and wildlife habitat and that present a nuisance, impairing aesthetics and recreation values of affected 303(d)-listed water bodies.

Estimating the monetary value of these beneficial use effects is greatly limited by available data, and uncertainties about specific effects on beneficial uses from changes in water quality caused by the Proposed Regulations. An additional analytical challenge is that contaminants from OWTS may be one of several sources of contaminants (refer to Table 4-1.12) that contribute to beneficial use restrictions, making attribution of water quality benefits to project-related OWTS operational improvements difficult. For example, in most watersheds, OWTS are just one contributor to impairment along with such other contributors as agricultural-related fertilizer and chemical use, runoff from urban, municipal and industrial land uses, and in some areas, discharges from treatment plants. For some beneficial uses, useful information is available on the frequency of OWTS-related incidents (e.g., beach closures) and on the current economic value of affected beneficial uses, but the impact of the Proposed Regulations on these uses and values is highly uncertain.

Beach closures and advisories represent one effect that is relatively tractable. OWTS have been identified as a primary source of contaminants affecting beach activities near Malibu and along northern Santa Monica Bay. According to information compiled by the Natural Resource Defense Council (2007), beach closures or advisories were in effect on 487 days during 2006. These closures and advisories directly contribute to lost beach days and to reduced values for beach goers who do visit. Based on information from Hanemann et al. 2005, improving the water quality at Malibu Surfrider Beach, which accounted for 30 percent of the beach closures and advisories along northern Santa Monica Bay beaches in 2006, from a grade of C to B would increase benefits to beach goers by an estimated $140,000 annually. (The water quality grades used in the analysis are part of an A-to-F scale developed by the Heal the Bay Association.)

Exposure of beachgoers to high bacterial levels also incurs public health costs measured in terms of increased incidences of bacterial-related illnesses. For example, a study of public health costs related to exposure to polluted marine waters in Orange County, California found that exposure to polluted waters at Newport and Huntington Beaches was responsible for nearly 75,000 episodes of gastrointestinal and other types of bacterial-related illnesses, with an annual public health cost of about $3.3 million (in 2001 dollars). Data on illness severity and estimates of annual salaries and medical costs for residents of Orange County were used to derive the estimates. Although pollutant sources other than OWTS were primarily responsible for the adverse public health impacts in Orange County described above, this example demonstrates some of the notable and adverse economic effects that bacteria-related illnesses can cause.

Excessive levels of nitrates and other nutrients can impair drinking water, causing odor nuisance and public health concerns. Cost savings associated with removing contaminants from drinking water supply systems is another form of use benefit. Although the extent to which nitrates from OWTS impair drinking water supplies is unknown and varies from watershed to watershed,

treating water supplies already contaminated with nitrates is costly. According to information published by the Penn State Department of Agricultural and Biological Engineering (2004), the initial cost of reverse osmosis home systems used for treating nitrates is between $300 and $900, and does not include the high energy costs for operation. Unit costs for distillation systems range from $150 to $500 per unit. The extent to which reduction of nutrients from OWTS could obviate the need for nitrate treatment systems at private wells or reduce treatment costs at centralized plants is unknown, but given the large number of water bodies statewide that are sources of drinking water supplies and are also listed as potentially impaired for nutrients, the cost savings could be substantial.

In addition to direct and indirect effects on beneficial uses, water quality improvements from the Proposed Regulations can be expected to contribute to healthier functioning aquatic ecosystems. Meeting water quality standards designed to protect beneficial uses is likely to contribute to the overall health and diversity of aquatic and terrestrial species, including improving conditions for the successful recovery of some threatened and endangered species. The economic literature (see, for example, EVRI database) includes hundreds of empirical studies that demonstrate the public's substantial willingness to pay for programs and policies that enhance fish and wildlife habitat and lead to sustainable fish and wildlife populations. As discussed in U.S. EPA's (1997) economic assessment of the California toxics rule, empirical evidence from review of the extensive literature indicates that nonuse values associated with improved water quality and/or fisheries have been estimated to be at least half as much as relevant recreational values, thereby leading to development of a "50 percent rule of thumb" estimate for nonuse values.

In summary, the Proposed Regulations are expected to substantially improve water quality conditions at certain 303(d)-listed water bodies and potentially contribute to water quality improvement at nearly 300 additional water bodies where OWTS are suspected of contributing to impaired water quality. Less notable but positive water quality improvements would also occur throughout the rest of the state where OWTS are used. Most impaired water bodies, including Northern Santa Monica beaches, Santa Clara River, Canyon Lake, and the Malibu Creek watershed, support substantial numbers of recreationists participating in both water contact and noncontact water recreation activities. In addition, some of these water bodies are important sources of municipal and domestic water supplies. Although the total benefits of water quality improvements are difficult to quantify because of the large volume of affected areas and associated beneficial uses and the contribution of a variety of sources to impairment, the Proposed Regulations could lead to fewer beach closures and advisories, and substantial reductions in public health costs related to exposure to high bacteriological conditions. Such beneficial effects and their associated positive economic impacts would likely be most notable in such impaired areas as Malibu and Santa Monica Bay beaches where OWTS are the major contributor to impairment. The Proposed Regulations could also help reduce drinking water treatment costs where excessive nitrates are found in water supplies, and help improve fish and wildlife habitat conditions and aesthetic conditions for recreation.

Benefit-Cost Assessment

For purposes of assessing the economic efficiency of regulations, Standard 399 Form requests a comparison of costs and benefits for the Proposed Regulation. Ideally, all relevant

costs and benefits would be quantified, monetized, and converted to present values. However, as is typically the case with regulations or public policies with far-reaching environmental effects, the costs are far easier to quantify than the benefits. Developing monetary estimates of potential benefits, in this case, the value of water quality improvements, requires a level of scientific investigation of the physical and biological relationships underlying the economic values that is not feasible.

For the Proposed Regulations, annual statewide costs to households and businesses, compared to No Project baseline costs, are estimated to increase by $287-$340 million, with costs to households and businesses in 303(d)-listed areas to increase by about $35.4 million annually. Although the annual costs will decrease significantly after the initial 5-year implementation period (2009 through 2013), the costs are obviously substantial. Given the limited specification and quantification of benefits from expected water quality improvements, the relevant question is whether it is reasonable to believe that the benefits could equal or exceed the estimated costs.

California has a current population of more than 35 million, by far the most populated state in the country. Its economy is often cited as the 6th or 7th largest in the world. Surveys consistently show that state residents consider protecting the environment among the most important public policy priorities. In fact, state residents have approved over the past 10 years more than $10 billion in bond measures specifically earmarked for environmental improvement programs, particularly water quality. In addition, contingent valuation studies have shown that residents are willing to pay substantial amounts annually to protect water quality and other environmental conditions.

A seminal study (Carson and Mitchell 1993) conducted in the 1980's and often cited in support of water quality programs examined the public's willingness to pay for achieving different levels of water quality. Based on results of a nationwide survey, the benefits of achieving the national swimmable water quality goal for the nation's surface waters was estimated at $29.2 billion a year (1990 dollars). A similar study (Freeman 1982) found the benefits of achieving the ambient quality conditions believed to be associated with meeting best available technology provisions of the Clean Water Act to be about $20 billion a year (1990 dollars).

Although drawing inferences about the water quality benefits of the Proposed Regulations from these studies and from the public's willingness to approve and pay for environmental bond measures is necessarily limited, the evidence does suggest that residents of California place a high premium on environmental quality. Residents have consistently demonstrated a willingness to pay for major programs that provide the types of environmental improvements that the Proposed Regulations are expected to contribute to.

Economic Benefits to OWTS-Related Businesses

The Proposed Regulations would generate increased spending on OWTS and OWTS-related services that would benefit OWTS-related businesses throughout California. Businesses that would directly benefit from increased OWTS-related spending and jobs creation include septic system contractors that design and install OWTS, septic tank inspection businesses, testing laboratories that specialize in collecting and testing groundwater and effluent samples, firms that

conduct groundwater level determinations, and qualified professionals who can prepare OWTS maintenance manuals and monitor and maintain OWTS. Additional jobs would be indirectly generated in many other sectors of regional economies as OWTS-related businesses spend on goods and services needed to conduct their businesses and as their employees spend on consumer goods and services.

This section describes the impacts on OWTS-related businesses and the associated effects on local economies from estimated increases in OWTS-related spending. It should be noted, however, that increased spending on OWTS and related services would have some corresponding reductions in spending on other goods and services as households and businesses shift their spending patterns. The effects of these reductions in spending are not evaluated here.

Methods and Assumptions

The assessment of benefits on OWTS-related businesses focuses on estimating the number and type of businesses directly benefiting from expansion of OWTS-related work, and the number of jobs generated in these businesses and other businesses that trade with them. The assessment is conducted at the state level and at the county level for the two case-study counties. The assessment for Los Angeles County includes consideration of spending generated by households and businesses in 303(d) areas located within Los Angeles County. An estimated 2,483 of the potentially affected 2,798 OWTS in 303(d) areas statewide are located in Los Angeles County. Effects in other 303(d) areas are expected to be similar to those estimated for Los Angeles County, with the magnitude of effects in each area similar to the relative differences in projected compliance costs and sizes of the regional economies compared to Los Angeles County.

OWTS-related costs for businesses and households (see "Private Sector Costs" above) were used as inputs to estimate the economic benefits to businesses (i.e., jobs and new businesses). Each OWTS-related cost category was assigned to its relevant industrial categories, as defined by the North American Industry Classification System (NAICS) based on the probable types of businesses that would be affected by compliance-related spending. The NAICS categories were then mapped to their matching industrial sectors in the IMPLAN input-output model (Table 11), which was used to estimate the economic impacts of the Proposed Regulations. The IMPLAN model was developed in 1979 by the Forest Service and is one of the most widely used input-output models for evaluating changes in policy and producing socioeconomic forecasts. Its primary attribute is that it captures multiplier effects as changes in policy create ripples throughout the economy (Minnesota IMPLAN Group 2000).

Table 11. Mapping of OWTS Cost Categories to NAICS and IMPLAN Industrial Sectors

OWTS Cost Category	Business Type (NAICS Industrial Category/Code)	IMPLAN Industrial Sector (IMPLAN Sector Number)
Designing, siting, and installing OWTS	Septic system contractors (Site preparation contractors/238910)	Water, sewer, and pipeline construction (40)
Inspecting septic tanks	Septic tank cleaning and pumping services (Septic tank and related services/562991)	Waste management and remediation services (460)
Groundwater sampling from a domestic water or monitoring well	Testing laboratories, except medical, veterinary (Testing	Architectural and engineering services (439)

	laboratories/541380)	
OWTS maintenance contract with a service provider	Septic system contractors (Site preparation contractors/238910)	Water, sewer, and pipeline construction (40)
Collecting and testing effluent samples	Testing laboratories, except medical, veterinary (Testing laboratories/541380)	Architectural and engineering services (439)
Groundwater level monitoring	Water well pump and well piping system installation (Water and Sewer Line and Related Structures Construction/237110)	Water, sewer, and pipeline construction (40)
Weekly system inspections/remote telemetric monitoring	Septic tank cleaning and pumping services (Septic tank and related services/562991)	Waste management and remediation services (460)

IMPLAN models were constructed individually for California, Los Angeles County, and Merced County using 2006 IMPLAN data bases specific to each area. Estimated and projected annualized OWTS-related costs for existing baseline, future baseline, and the Proposed Regulations were then input to the IMPLAN model to generate estimates of jobs (full- and part-time) generated by spending in each cost category for each geographic area of interest.

The number of new businesses potentially established by the increased demand for OWTS-related equipment and services was estimated based on the average size of businesses in the NAICS industrial sector affected by the Proposed Regulations. Average business size was calculated using data on the number of establishments and number of employees in the 2004 California County Business Patterns Report for 2004 (U.S. Census Bureau 2006b). The number of employees estimated by the IMPLAN model to be generated by OWTS-related spending in each sector was then divided by the average business size in each sector to derive an estimate of the number of new businesses that could be supported by OWTS-related spending. This calculation provides an upper bound on the number of new businesses that could be created by the Proposed Regulations because existing businesses would absorb an unknown percentage of the increased demand for equipment and services. In essence, this calculation should be viewed as the projected number of new and existing businesses affected by the project. Table 12 shows the average business sizes (employees per business) for each NAICS category and geographic area incorporated into the analysis.

Table 12. Average Business Size (Employees per Establishment) for NAICS Categories and Geographic Areas

Business Type (NAICS Industrial Category/Code)	California	Los Angeles County	Merced County
Septic system contractors (Site preparation contractors/238910)	11.0	11.1	5.3
Water well pump and well piping system installation (Water and Sewer Line and Related Structures Construction/237110)	18.8	23.6	12.4
Testing laboratories, except medical, veterinary (Testing laboratories/541380)	16.4	17.6	9.5
Septic tank inspection services (Septic tank and related services/562991)	13.9	13.9	13.9
All other industrial sectors	15.8	16.2	14.4

Source: Calculated by data in the 2004 California business patterns report (U.S. Census Bureau 2006b). Note that the statewide average business size for septic tank inspection services was also used for Los Angeles County and Merced County due to lack of adequate data to estimate business size for the two counties.

Baseline Conditions

2008 Conditions

The number of jobs supported annually by OWTS-related spending in California and in the case-study counties under existing baseline conditions (2008), future baseline conditions (2013), and the Proposed Regulations are shown in Table 13. Table 14 shows these effects for the combined 303(d) areas in Los Angeles County. The number of new and existing businesses anticipated to benefit from the spending is summarized in Tables 15 and 16.

Statewide. Under existing baseline conditions, annual average OWTS-related spending in 2008 is estimated at between $495.8 and $510.6 million. This spending is estimated to directly and indirectly support 8,784 full- and part-time jobs (Table 13). About 3,422 of these jobs are estimated to be directly generated in OWTS-related industries, predominantly in businesses that design, site, and install OWTS and in businesses that inspect septic tanks. The number of businesses statewide that would benefit from this spending is estimated to be 597, including 281 businesses in OWTS-related industries (Table 15).

Case Study Counties. For the case-study county of Los Angeles, OWTS-related spending in 2008 is estimated to support 562 jobs, including 243 jobs in OWTS-related industries (Table 13). The spending is estimated to directly benefit 18 businesses in OWTS-related industries in Los Angeles County (Table 15).

In Merced County, jobs supported by OWTS-related spending in the county in 2008 are estimated to support 88 jobs, including 52 jobs in OWTS-related industries (Table 13). This spending is estimated to benefit 6 businesses in OWTS-related industries (Table 15).

303(d) Areas. As discussed previously, OWTS-related spending for 303(d) areas was assessed only for Los Angeles County. Combined, spending on OWTS in the Malibu Creek watershed area, the northern Santa Monica Bay beach area, and the Santa Clara River (the portion in Los Angeles County) area directly and indirectly would support an estimated 13 jobs in 2008, with about half of these jobs in OWTS-related businesses (Table 14). This spending is estimated to benefit only a few businesses (Table 16).

2013 Future Conditions

Statewide. Under future baseline conditions, OWTS-related spending in California is projected to directly and indirectly support about 12,000 full- and part-time jobs annually over the 2009-2013 period (Table 13). About 4,700 of these jobs are projected to be directly generated in OWTS-related industries, predominantly in businesses that design, site, and install OWTS and in businesses that inspect septic tanks. Annual employment supported by OWTS-related spending under future baseline conditions is projected to be 36 percent higher than in 2008, with much of this increase attributable to statewide population growth over the 2009-2103 period.

Table 13. Estimated Annual Jobs Generated by OWTS-Related Spending Under Existing (2008), No Project, and Proposed Project Conditions: California, Los Angeles County, and Merced County

IMPLAN Sector	Existing Conditions (2008)			Future Baseline (Average 2009-2013)			Proposed Project (Average 2009-2013)				
	Direct	Indirect & Induced	Total Jobs	Direct	Indirect & Induced	Total Jobs	Direct	Indirect & Induced	Total Jobs	Increase from Existing	Increase from No Project
California											
Water, sewer & pipeline construction[a]	3,181	7	3,188	4,413	10	4,423	6,229	16	6,245	3,057	1,822
Architectural & engineering services[b]	2	330	332	4	456	460	656	709	1,365	1,033	905
Waste management & remediation services[c]	239	31	270	259	37	296	590	75	665	395	369
All other sectors	0	4,994	4,994	0	6,796	6,796	0	11,183	11,183	6,189	4,387
Total	3,422	5,362	8,784	4,676	7,299	11,975	7,475	11,983	19,458	10,674	7,483
Los Angeles County											
Water, sewer & pipeline construction[a]	226	0	226	295	1	296	479	1	480	254	184
Architectural & engineering services[b]	0	21	21	0	27	27	54	49	103	82	76
Waste management & remediation services[c]	17	2	19	19	2	21	74	8	82	63	61
All other sectors	0	296	296	0	381	381	0	776	776	480	395
Total	243	319	562	314	411	725	607	834	1,441	879	716
Merced County											
Water, sewer & pipeline construction[a]	47	0	47	65	0	65	86	0	86	39	21
Architectural & engineering services[b]	0	1	1	0	1	1	10	2	12	11	11
Waste management & remediation services[c]	5	0	5	5	1	6	12	1	13	8	7
All other sectors	0	35	35	0	47	47	0	76	76	41	29
Total	52	36	88	70	49	119	108	79	187	99	68

Source: IMPLAN input-output model runs, based on OWTS-related cost estimates for households and businesses.

[a] Sector includes businesses that design, site, and install OWTS and businesses that conduct groundwater monitoring.

[b] Sector includes businesses that sample and test groundwater from domestic water or monitoring wells and that collect and test effluent samples.

[c] Sector includes businesses that inspect tanks , and that inspect and conduct telemetric monitoring of septic systems.

Table 14. Estimated Annual Jobs Generated by OWTS-Related Spending Under Existing (2008), No Project, and Proposed Project Conditions: Combined 303(d) Areas in Los Angeles County[a]

IMPLAN Sector	Existing Conditions (2008)			Future Baseline (Average 2009-2013)			Proposed Project (Average 2009-2013)				
	Direct	Indirect & Induced	Total Jobs	Direct	Indirect & Induced	Total Jobs	Direct	Indirect & Induced	Total Jobs	Increase from Existing	Increase from No Project
Water, sewer & pipeline construction[b]	5	0	5	6	0	6	176	0	176	171	170
Architectural & engineering services[c]	0	1	1	0	1	1	25	19	44	43	43
Waste management & remediation services[d]	1	0	1	1	0	1	35	3	38	37	37
All other sectors	0	6	6	0	8	8	0	306	306	300	298
Total	6	7	13	7	9	16	236	328	564	551	548

Source: IMPLAN input-output model runs, based on OWTS-related cost estimates for households and businesses.

[a] Includes Malibu Creek, Northern Santa Monica Bay Beaches, and Santa Clara River (the portion of the watershed in Los Angeles County).

[b] Sector includes businesses that design, site, and install OWTS and businesses that conduct groundwater monitoring.

[c] Sector includes businesses that sample and test groundwater from domestic water or monitoring wells and that collect and test effluent samples.

[d] Sector includes business that inspect septic tanks , and that inspect and conduct telemetric monitoring of septic systems.

Table 15. Estimated Number of New and Existing Businesses Benefiting from OWTS-Related Spending under the Existing Baseline, Future Baseline, and Proposed Regulations: California, Los Angeles County, and Merced County

IMPLAN Sector	Existing Baseline (2008)	Future Baseline (Average 2009-2013)	Proposed Regulations (Average 2009-2013)		
			Proposed Regulations	Increase from Existing	Increase from No Project
California					
Water, sewer & pipeline construction[a]	242	335	473	231	138
Architectural & engineering services[b]	20	28	83	63	55
Waste management & remediation services[c]	19	21	48	29	27
All other sectors	316	430	708	392	278
Total	597	814	1,312	715	498
Los Angeles County					
Water, sewer & pipeline construction[a]	16	21	34	18	13
Architectural & engineering services[b]	1	2	6	5	4
Waste management & remediation services[c]	1	2	6	5	4
All other sectors	18	24	48	30	24
Total	36	49	94	58	45
Merced County					
Water, sewer & pipeline construction[a]	6	9	12	6	3
Architectural & engineering services[b]	0	0	1	1	1
Waste management & remediation services[c]	0	0	1	1	1
All other sectors	2	3	5	3	2
Total	8	12	19	11	7

Source: Estimated based on output from IMPLAN input-output model runs and data on average business sizes in affected industrial sectors.

[a] Sector includes businesses that design, site, and install OWTS and businesses that conduct groundwater monitoring.

[b] Sector includes businesses that sample and test groundwater from domestic water or monitoring wells and that collect and test effluent samples.

[c] Sector includes businesses that inspect septic tanks, and that inspect and conduct telemetric monitoring of septic systems.

Table 16. Estimated Number of New and Existing Businesses Benefiting from OWTS-Related Spending under the Existing Baseline, Future Baseline, and Proposed Regulations: Combined 303(d) Areas in Los Angeles County[a]

IMPLAN Sector	Existing Baseline (2008)	Future Baseline (Average 2009-2013)	Proposed Regulations (Average 2009-2013)		
			Proposed Regulations	Increase from Existing	Increase from No Project
Water, sewer & pipeline construction[b]	1	1	13	12	12
Architectural & engineering services[c]	0	0	3	3	3
Waste management & remediation services[d]	0	0	3	3	3
All other sectors	1	1	19	18	18
Total	2	2	38	36	36

Source: Estimated based on output from IMPLAN input-output model runs and data on average business sizes in affected industrial sectors.

[a] Includes Malibu Creek, Northern Santa Monica Bay Beaches, and Santa Clara River (the portion of the watershed in Los Angeles County).

[b] Sector includes businesses that design, site, and install OWTS and businesses that conduct groundwater monitoring.

[c] Sector includes businesses that sample and test groundwater from domestic water or monitoring wells and that collect and test effluent samples.

[d] Sector includes business that inspect tanks, and that inspect and conduct telemetric monitoring of septic systems.

The number of businesses statewide that would benefit from OWTS-related spending is estimated at 814, including 384 businesses in OWTS-related industries (Table 15).

Case Study Counties. For the case-study county of Los Angeles, OWTS-related spending under future baseline conditions is projected to annually support 725 jobs, or 29 percent more jobs than in 2008. These jobs include 314 in OWTS-related industries (Table 13). The spending is projected to directly benefit 25 businesses in OWTS-related industries in Los Angeles County (Table 15).

In Merced County, OWTS-related spending is projected to support 119 jobs, an increase of 35 percent in OWTS-supported employment compared to 2008. About 70 of these jobs would be in OWTS-related industries (Table 13). OWTS-related spending is anticipated to benefit 9 businesses in OWTS-related industries (Table 15).

303(d) Areas. Combined, spending on OWTS in the Malibu Creek watershed area, the northern Santa Monica Bay beach area, and the Santa Clara River (the portion in Los Angeles County) area is projected to directly and indirectly support 16 jobs over the 2009-2013 period, with fewer than half of these jobs in OWTS-related businesses (Table 14). This spending is estimated to benefit only a few businesses in Los Angeles County (Table 16).

Proposed Regulations

Statewide

Under the Proposed Regulations, average annual OWTS-related spending statewide between 2009 and 2013 is projected to increase by $431.1-$465.8 million over 2008 spending levels and by $287.0-$339.7 million over 2013 future baseline spending levels (Table 8). This spending would generate increased economic activity in regions throughout California.

The spending generated by implementing the Proposed Regulations is projected to annually support an average of about 19,500 jobs statewide over the 2009-2013 period (Table 13). Of these jobs, about 7,500 would be in OWTS-related industries with the remainder in other sectors of California's economy. The statewide employment supported by OWTS-related spending under the Proposed Regulations would be substantially greater than under 2008 existing baseline conditions and 2013 future baseline conditions. As Table 13 shows, the number of jobs generated annually by OWTS-related spending is projected to be about 10,700 greater than in 2008, and about 7,500 greater than under future baseline conditions.

Implementation of the Proposed Regulations could benefit about 1,310 business statewide, including more than 700 new businesses created over the 2009-2013 period (Table 15). Relative to future baseline conditions, spending under the Proposed Regulations is projected to support up to about 500 new businesses. Assuming that the percentage of new business that would fall into the small businesses category (i.e., establishments with fewer than 100 employees) is the same as the existing statewide percentage of businesses in that category (97.7 percent), about 700 of the new businesses created over the 2009-2013 would be small businesses. Relative to future

baseline conditions, a projected 485 new small businesses would be created by spending under the Proposed Regulations.

Table 17 provides a more detailed summary of the categories of OWTS-related businesses anticipated to benefit from implementation of the Proposed Regulations. As shown, OWTS-related businesses that would benefit the most are firms that design, site, and install OWTS. Relative to future baseline conditions, this industry is projected to absorb about 24 percent of the new jobs and about 27 percent of the new businesses supported by spending under the Proposed Regulations. The septic tank inspection and maintenance industries would also receive a relatively large share of the statewide economic benefits of the Proposed Regulations. Note that more than half of the new jobs created under the Proposed Regulations would be in non-OWTS-related businesses that would indirectly benefit by the spending of OWTS-related firms and the induced spending of employees in directly and indirectly affected businesses.

Table 17. Types of Jobs and Businesses in California Supported by OWTS-Related Spending under the Proposed Regulations

	Jobs Supported by the Proposed Regulations			Businesses Created or Benefiting from the Proposed Regulations		
Business Type	Total Jobs	Increase from Existing Baseline	Increase from Future Baseline	Total Businesses	Increase from Existing Baseline	Increase from Future Baseline
OWTS design & installation businesses	5,557	2,510	1,332	421	190	101
OWTS maintenance contractors	490	490	490	37	37	37
Groundwater monitoring businesses	198	57	0	15	4	0
Groundwater sampling & testing businesses	745	745	745	45	45	45
Effluent collecting & testing businesses	620	288	160	38	18	10
Septic tank inspecting businesses	576	306	280	42	23	21
OWTS inspection & telemetric monitoring businesses	89	89	89	6	6	6
Non-OWTS-related businesses	11,183	6,189	4,387	708	392	278
Total	19,458	10,674	7,483	1,312	715	498

Source: Estimated based on OWTS-related cost projections for the Proposed Regulations, output from IMPLAN input-output model runs, and data on average business sizes in affected industrial sectors.

Case Study Counties

Under the Proposed Regulations, average annual OWTS-related spending between 2009 and 2013 in Los Angeles County is projected to increase by $42.6-$47.4 million over 2008 spending levels and by $35.4-$40.9 million over 2013 future baseline spending levels (Table 8). This spending is projected to annually support an average of 1,440 jobs, including 610 in OWTS-

related industries, in Los Angeles County (Table 13). About 33 percent of the total jobs would be in industries that design, site, and install OWTS and that conduct groundwater monitoring. Relative to the 2008 existing baseline, OWTS-related spending would support about 880 new jobs, potentially leading to the creation of up to 60 new businesses, including 57 small businesses, in the county (Tables 13 and 15). Relative to the 2013 future baseline, new economic activity in Los Angeles County would include 720 new jobs and up to 45 new businesses.

In Merced County, average annual OWTS-related spending between 2009 and 2013 under the Proposed Regulations is projected to increase by $5.8-$5.9 million over 2008 spending levels and by $4.1-$4.2 million over 2013 future baseline spending levels (Table 8). This spending is projected to annually support an average of about 190 jobs, including about 110 in OWTS-related industries, over the 2009-2013 period (Table 13). About 46 percent of the total jobs would be in industries that design, site, and install OWTS and that conduct groundwater monitoring. Relative to the 2008 existing baseline, OWTS-related spending would support about 100 new jobs, potentially leading to the creation of up to 11 new businesses, all of which would be small businesses, in the county (Tables 13 and 15). Relative to the 2013 future baseline, new economic activity in Merced County would include a projected 68 new jobs and up to 7 new businesses.

303(d) Areas

Combined, average annual spending on OWTS in the Malibu Creek, Northern Santa Monica Bay Beaches, and Santa Clara River (the portion in Los Angeles County) 303(d) areas under the Proposed Regulations is projected to increase by $32.0 million over 2008 spending and by $31.9 million over 2013 future baseline spending levels. This spending is projected to annually support an average of 564 jobs over the 2009-2013 period, with 42 percent of these jobs in OWTS-related businesses (Table 14). Because of the Proposed Regulations' requirement that STS must be used within 303(d) areas, the regional economic effects resulting from OWTS-related spending in Los Angeles County's 303(d) areas would be relatively high. Compared to 2008 existing baseline conditions, employment is projected to increase by 551 jobs, potentially creating 36 new businesses (Tables 14 and 16). Effects relative to 2013 future baseline conditions would be similar, with spending in 303(d) areas under the Proposed Regulations projected to support 548 additional jobs and up to 36 new businesses in Los Angeles County.

Based on cost estimates prepared for the other 303(d) areas in California (Table 9), the regional economic effects resulting from OWTS-related spending in 303(d) areas would be higher in Los Angeles County than in other counties within California. For example, OWTS-related spending in the Rainbow Creek 303(d) area is projected to be about 7.2 percent of the spending in Los Angeles County 303(d) areas, suggesting that regional economic effects would be more than 90 percent lower than those projected for Los Angeles County. Regional economic effects in counties with other 303(d) areas would be even lower, based on relative differences in spending in those areas.

Property Value and Real Estate Transaction Effects

Proposed Regulations

Transaction costs and timing requirements for the closing of real estate transactions in 303(d) areas are not expected to be affected by the Proposed Regulations. Based on interpretation of the Proposed Regulations by State Water Board staff, the reporting of water quality monitoring data to the State Water Board will result in either minor or no effects on real estate property transactions. Potential effects on property values in non 303(d)-listed areas resulting from requirements for installing supplemental systems in areas with high percolation rates and shallow groundwater are not expected to be extensive.

It should be noted that earlier draft versions of the Proposed Regulations required water quality monitoring data to be reported to the State Water Board at the point of real estate transactions; this requirement, however, subsequently was deleted from the Proposed Regulations, removing a potential impediment to the timely closing of real estate transactions.

FISCAL IMPACTS OF THE PROPOSED REGULATIONS

Fiscal impacts on local, regional, and state agencies could result from changes in OWTS-related regulations by requiring agencies to devote more resources to implementing new or more-intensive OWTS-related regulations. For example, changes in regulations could require agencies to spend more staff time and budget on OWTS siting and inspection issues, permit review and issuance actions, system monitoring activities, and reporting requirements. As discussed below, the Proposed Regulations are anticipated to result in minimal fiscal effects on agencies.

Local Agency Effects

Proposed Regulations

Implementation of the Proposed Regulations would not change the existing OWTS regulatory and permitting process at the local and regional level. Specifically, implementation of the Proposed Regulations would not affect the existing processes for issuance of waste discharge requirements and waivers or the need to comply with regional water board basin plans. Nor would the Proposed Regulations change the way new systems are regulated by local agencies in conjunction with building permits. Although local and regional government agencies have expressed concerns about how earlier versions of the Proposed Regulations would increase their staffing needs and costs for implementing new regulatory requirements, the Proposed Regulations are anticipated to be largely self-implementing. The Proposed Regulations would minimize agency staffing and cost effects by requiring OWTS owners to comply with the regulations in conjunction with a State waiver. The individual OWTS permits issued by the local and regional agencies to do regulatory oversight using the existing regulatory program and by tracking, monitoring, and reporting activities will remain unchanged. Additionally, the number of new OWTS permits required to be issued by local and regional agencies is not expected to change relative to future baseline conditions. (Giannopoulos and Thompson, pers. comm., 2007)

Another major source of concern expressed by local agencies during the drafting of the Proposed Regulations was that regulations potentially would generate a demand by the public to access the new water quality monitoring database that would be established by the regulations. This database, however, would be maintained by the State Water Board rather than local or regional agencies. Members of the public seeking water quality monitoring data will be able to obtain data from public websites. (Giannopoulos and Thompson, pers. comm., 2007)

State Agency Effects

Proposed Regulations

The State Water Board does not anticipate the need to increase staffing levels beyond existing needs to support implementation of the Proposed Regulations (Giannopoulos and Thompson, pers. comm., 2007). The fiscal effects of the Proposed Regulations on state agencies are therefore anticipated to be minimal relative to existing and future baseline conditions.

Effects on Federal Funding of State Programs

Proposed Regulations

Implementation of the Proposed Regulations is not anticipated to adversely affect federal funding of State programs.

ECONOMIC AND FISCAL IMPLICATIONS OF POTENTIAL GROWTH EFFECTS

This section addresses economic and fiscal implications of potential growth effects of the Proposed Regulation.

Proposed Regulations

Growth can affect economic conditions of a region by contributing to economic development, thereby creating jobs and generating income for businesses and residents. Growth also can affect the fiscal condition of local governments. For example, new homes and businesses provide new tax revenues and represent new ratepayers for water, sewer, and other services. At the same time, growth increases the demand for those services and general public functions, such as schools, police, fire protection, and roads.

The most apparent growth-generating aspect of the Proposed Regulations is related to the statewide and regional jobs that would be generated by OWTS-related spending. As discussed in the Economic Benefits to OWTS-Related Businesses section of this report, OWTS-related spending statewide under the Proposed Regulations is projected to directly and indirectly annually generate about 10,700 more jobs in California businesses compared to existing 2008 conditions and about 7,483 more jobs compared to future baseline conditions. (These job increases do not account for any corresponding job decrease due to reduced spending on non-OWTS-related goods and services.)

The economic and fiscal impacts of growth generated by the additional OWTS-related jobs, positive or negative, are difficult to assess and depend a great deal on the location and rate of growth. New hiring of qualified OWTS professionals and service providers generated by OWTS-related spending could occur at locations anywhere in California; the resultant population growth would not be concentrated in any particular area nor is it anticipated to be substantial in any particular area. For example, in the case-study counties of Los Angeles and Merced, projected OWTS-related employment growth under the Proposed Regulations would represent only 0.01 and 0.1 percent, respectively, of the employment within these two counties in 2006. The new employment opportunities generated by the Proposed Regulations, while beneficial from an industry perspective, are not anticipated to generate substantial new economic and fiscal effects.

Employment generated by the Proposed Regulations has the potential to generate more concentrated growth within and near 303(d) areas than in the non-303(d) areas of the state because of the more-intensive nature of the proposed OWTS regulations in 303(d) areas. Within Los Angeles County, where an estimated 2,483 of the potentially affected 3,323 OWTS in statewide 303(d) areas are located, the Proposed Regulations are projected to directly generate about 240 additional OWTS-related jobs within the county than under existing and future baseline conditions. (Effects in other 303(d) areas are expected to be similar to those estimated for Los Angeles County, with the magnitude of effects in each area relative to differences in projected compliance costs and sizes of the regional economies of each area.)

In addition to the growth impacts potentially attributable to OWTS-related employment effects, the Proposed Regulations could affect growth throughout the state in other ways. For example:

- Legal lots that were previously unbuildable could become buildable, thereby opening land for development that cannot currently be developed.

- Growth could occur in places where the local regulations for OWTS are currently more protective of the environment and in areas where OWTS with supplemental treatment components are not currently allowed.

- In areas where OWTS are no longer an option, expansion of public sewer or community wastewater collection systems could occur, and this would remove an obstacle to growth.

- The Proposed Regulations could render existing lots throughout the state unbuildable or prevent people from building in areas already designated for development.

These potential growth-inducing or growth-restricting issues were evaluated as part of the growth inducement assessment prepared for the draft EIR on the Proposed Regulations. Based on this assessment, the amount of growth potentially encouraged or discouraged by the Proposed Regulations is considered speculative. Due to the speculative nature of these potential effects, no attempt was made to evaluate the potential economic or fiscal impacts resulting from these effects.

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ATTACHMENT A: REPRESENTATIVE UNIT COSTS FOR OWTS-RELATED DESIGN, INSTALLATION, AND MAINTENANCE

Representative costs for OWTS-related items are presented in Table A-1, which provides estimated ranges and midpoints for each cost item. These costs are expressed in 2007 dollars and are considered representative at most, but not all, local jurisdictions. Some types of costs are not applicable in some jurisdictions. For example, the costs of seepage pits are not applicable in some jurisdictions because such pits are not allowed. Other costs, such as designing, siting, and installing conventional OWTS, are representative for all jurisdictions. Additionally, some cost items would be new for many jurisdictions under the Proposed Regulations, such as costs related to supplemental treatment systems (STS). STS are relatively new technologies that currently cannot be used for new construction in most jurisdictions. Although STS costs are higher than conventional systems costs, installing STS may allow a landowner to develop land that otherwise might not be suitable for construction.

OWTS-related costs, including the costs to design, install, and maintain conventional OWTS and STS, vary throughout California. Some of the most common factors affecting costs include:

- **Local labor and equipment rates**, which vary based on local supply and demand conditions, the cost of living, and other considerations;

- **Site conditions,** such as targeted capacity of the system versus the parcel size, difficulty of terrain, and the extent of site evaluation requirements (e.g., percolation testing, groundwater monitoring, soil sampling, and laboratory analyses);

- **Design factors,** such as simple engineered plans for easy sites versus complex plans for a highly constrained site requiring topographic mapping, construction documents, extensive negotiation with the permitting agency, and construction observation by the designer;

- **Installation factors,** including size of the system, specific transportation costs to a particular site (e.g., cost of hauling gravel to a remote site), and county standards. For STS, the local agency may add cost for certain requirements; and.

- **Maintenance and monitoring service factors,** such as knowledge of septic tank location when inspecting tanks, presence or absence of maintenance access risers, type of service provider (dedicated repair and maintenance service provider, septic pumper, or installation contractor).

Other cost variables are noted in Table A-1 as they relate to specific cost items.

The cost estimates in Table A-1 were mostly developed by Pete Lescure of Lescure Engineers in northern California, with considerable input from two other OWTS professional Mike Treinen, a registered environmental health specialist and wastewater consultant in northern California and Barbara Bradley with Advanced Onsite Systems in southern California. The cost estimates in

Table A-1 represent primarily costs in those counties where the OWTS professional have experience.

The costs were developed for a generic single family residence. All new STS are assumed to meet the applicable performance standards stated in the Proposed Regulations. Proprietary STS are assumed to meet the proposed certification requirements. Certain assumptions were necessary to make the cost items fit how costs occur in practice. For example, subsurface drip dispersal is always preceded by supplemental treatment. Therefore, these dispersal costs were included in the cost of a trickling filter and in the cost of suspended growth aerobic STS.

For the cost assessment described in this report, the following mid-point estimates from Table A-1 were used unless otherwise noted.

- Designing, siting, and installing conventional OWTS: new conventional OWTS = $18,600 for households, $23,300 for businesses; replaced OWTS with conventional OWTS = $9,650.

- Designing, siting, and installing new OWTS with STS: non-high strength = $35,000; high strength = $250,000.

- Replacing conventional OWTS with STS: non-high strength = $45,000; high strength = $250,000.

- Groundwater level determination = $1,250 (one-time) for households and businesses for new OWTS (existing baseline, future baseline, and Proposed Regulations).

- Inspecting septic tanks = $325 for households, $500 for businesses. Costs were annualized assuming that tank inspection would occur on average once every 10 years under 2008 existing baseline conditions and 2013 future baseline conditions, and once every 5 years under the Proposed Regulations. (Note that the assumption that inspection would occur more often under the Proposed Regulations is a worst-case assumption; State Water Board staff expects that many OWTS would not be inspected so frequently.)

- Groundwater sampling from a domestic water or monitoring well = $325. Costs were annualized based on sampling occurring once every 5 years, as required under the Proposed Regulations.

- STS maintenance contract with a service provider: annual STS maintenance contract = $700; annual monitoring and maintenance costs = $7,500 for non-high strength STS and $12,500 for high-strength STS.

- Collecting and testing effluent samples for STS = $1,300 annually ($325 per test). Cost annualized assuming that collecting and testing would be done quarterly under the Proposed Regulations, although this would not be required by the Proposed Regulations.

- Additional costs for STS with disinfection: weekly inspections = $7,800 annually ($150 per inspection), or telemetric monitoring = $740 annually ($500 for a service provider, $240 for a dedicated phone line).

Table A-1. Summary of Cost Estimates for Items Potentially Related to the Proposed OWTS Regulations

Cost Item	Estimated Range of Costs (Midpoint Cost)	Notes
1. Design, siting and installation of **conventional OWTS**	$13,875 - $23,285 ($18,600)	Single Family Residential (SFR) including siting, design, fees, and installation
2. "**State-of-the-art" supplemental treatment system (STS).** (Assumed to be the same as the trickling biofilter or suspended growth aerobic system with a sub-surface drip dispersal system – see the next section of this table.)	$25,000 to $40,000 ($32,500)	See related notes in the section below regarding the cost estimates of related STS technologies.
3. **Septic tank inspections**	$150 to $500 ($325)	Since this is primarily a labor-sensitive cost item, it will vary based on local labor costs and the cost of transportation. Tank only -Humboldt County (Steve's Septic) $95 plus excavation at $75/hr. Sonoma County Pumpers - $70 - $110 plus excavation at $70 – $110 A state registered consultant may charge $250 - $300 to do a tank *and* field inspection when the excavation is done by the owner or pumper at the above rates.
4. Domestic **well sampling**/groundwater quality monitoring and lab analysis	$200 to $450 ($325)	Cost per sample with related lab work Using the water quality monitoring constituents in the proposed statewide regulations, a local state approved lab (Brelje & Race) in Sonoma county would charge $395 ($345 w/o MBAS) to run the test. That amount does not include *sampling* if that is desired.

Table A-1 (cont.). Summary of Cost Estimates Related to the Proposed OWTS Regulations

Cost Item	Estimated Range of Costs (Midpoint Cost)	Notes
5. **Septic tank pumping and septage disposal fee**	$335 to $600 ($470)	As seen from the examples below, charges vary substantially, primarily with the availability and cost of dump sites. Sonoma County: $335-$500 for pumping. The sewer treatment plant charges $0.30/gallon to dump septage. To compete, more pumpers are buying large trucks and transferring small truck loads, then hauling to Oakland where rates are $0.08/gal. Any notable digging is at rates of $68-$110/hr. Humboldt County (source: Steve's Septic) has no dump site. Septage is generally dewatered and trucked to Gerlach, Nevada or Stockton, CA. Pumping rates are $425-$575. Digging is at $75/hr. Note: this is a critical area that is not being addressed in California as shown by the examples of trucking septage to another state or even to Oakland from Santa Rosa, a half day round trip. High pumping costs mean tank owners are less willing to pump their tanks on an appropriate frequency.
6. **Major repair of conventional OWTS** (not including upgrading to STS but does include new filter – a standard 46 certified filter)	$2,500 to $9,650 ($6,080)	Same basis as #1 except assumes only partial repair at the low end and complete replacement at the high end including filter installation.
7. Design, siting and installation of new **Primary treatment STS**	Not applicable (see notes)	Primary treatment is not a stand alone process but a fundamental component of all treatment systems and therefore included in the cost estimates of conventional systems and STS.

Table A-1 (cont.). Summary of Cost Estimates Related to the Proposed OWTS Regulations

Cost Item	Estimated Range of Costs (Midpoint Cost)	Notes
8. Design, siting and installation of new **Anoxic and anaerobic STS**	$10,500 – $16,000 ($13,250)	The process is found as a component of nitrification and denitrification and for treatment of high-strength waste, such as winery wastes. Includes design and installation as an additional process for nitrate removal that is added on to core STS such as in items 9 and 10 below. County fees are assumed to remain unchanged from those included in items 9 and 10.
9. Design, siting and installation of new **Trickling biofilters STS**	$25,875 to $49,885 ($37,900)	For SFR, including siting, design, fees, installation, startup, and O&M manual. Includes subsurface drip dispersal.
10. Design, siting and installation of new **Suspended growth aerobic STS**	$25,875 to $49,885 ($37,900)	For SFR, including siting, design, fees, installation, startup, and O&M manual. Includes subsurface drip dispersal.
11. Design, siting and installation of new **Solar plant-based treatment STS**	$27,500 - $39,500 ($33,500)	Solar plant-based STS are not feasible in the North Coastal Region due to high rainfall and limited evapotranspiration. They are more applicable to desert regions.
12. Design, siting and installation of new **Disinfection STS**	$3,200 to $6,100 ($4,650)	Includes design and installation as an additional treatment process that is added on to core STS such as items 9 and 10 above. County fees are assumed to remain unchanged from those included in items 9 and 10.
13. Design, siting and installation of new **Sub-surface drip dispersal systems**	Not applicable (see notes)	Drip is not a stand-alone technology – must be preceded by treatment. Costs are included in items 8 and 9 above.

Table A-1 (cont.). Summary of Cost Estimates Related to the Proposed OWTS Regulations

Cost Item	Estimated Range of Costs (Midpoint Cost)	Notes
14. **Other types of new dispersal systems**	a. Pressure Distribution Trenches: $16,500 to $23,500 ($20,000) b. Sand-Fill Mounds: $23,000 to $33,500 ($28,250) c. At-Grade Mounds: $15,500 to $23,500 ($19,500) d. Seepage Pits: $28,000 to $38,500 ($33,250) e. Bottomless Sand Filters: $26,000 to $36,000 ($31,000)	Low-end costs assume conventional treatment preceding disposal. High-end costs include STS treatment. The cost of sand is highly localized. Sand-fill mounds are becoming more expensive in the North Coast with increasing restrictions on in-stream mining of sand and gravel in the Russian River. The shift is from sand-filled mounds to STS combined with at-grade mounds or sub-surface drip dispersal.
15. **Replacement of conventional OWTS** with STS (additional costs not covered under items 8 through 14 above).	$600 to $1,000 ($800)	Cost to abandon the septic tank
16. **STS maintenance contract**	$400 to $1,000 per year ($700)	$500 is a normal baseline amount for checking on the system four times per year and monitoring it remotely with telemetry. $1,000 is the baseline contract amount in Malibu. Additional costs arise from repairs and tracking down and fixing the source of alarms. Cost also varies by baseline services provided, the type of system installed, and local agency requirements, e.g. for laboratory testing.

Table A-1 (cont.). Summary of Cost Estimates Related to the Proposed OWTS Regulations

Cost Item	Estimated Range of Costs (Midpoint Cost)	Notes
17. **Costs for OWTS owners to shut down their system and hook up to an expanded sewer or community collection system**	$30,000 to $80,000 ($55,000)	Upper limit may be higher. Cost affected by distance to hookup, number of homes hooking up and sharing the cost, fees by wastewater district, and construction difficulty due to the terrain, traffic, etc.
18. **Local government OWTS application and permit fees**	$775 to $2,385 ($1,580)	Integrated into the systems above. Cost variables include local policy and economics.
19. **Regional Water Board OWTS application and permit fees**	$400 to $1,500 ($550)	Section 2200, Article 1, Chapter 9, Division 3, Title 23.
20. Preparation of an **"O&M Manual"** by a Qualified Professional	Lower range: $500 to $1,000 ($750) Upper range: $3,000 to $10,000 ($6,500)	Magnitude and complexity of the system affects the cost: lower range shown is for SFR, upper range for a commercial business.
21. **Groundwater Level Determinations** (in areas where groundwater is known to be 10 feet or less below the surface) A. **Soil mottling** where feasible B. Where soil mottling is not feasible, installation of **groundwater monitoring well**	$1,000 to $1,500 ($1,250)	The low cost is for item A; the high cost is for item B. The high cost is with a minimum of three site visits, a report, fees and well installation costs.
22. **STS for high-strength waste dischargers**	$100,000 to $400,000 ($250,000)	Costs are for designing, siting, and installing STS system for businesses that are high-strength waste dischargers on OWTS that do not require large-capacity/high-flow volume systems. Restaurants would be the major type of business affected by this proposed requirement.

Table A-1 (cont.). Summary of Cost Estimates Related to the Proposed OWTS Regulations

Cost Item	Estimated Range of Costs (Midpoint Cost)	Notes
23. **Annual operation and maintenance of high-strength STS**	$10,000-$15,000 ($12,500)	High-strength STS systems would require higher annual operating costs to business users.

Note: All costs are expressed in 2007 dollars.
Sources: Bradley, Lescure and Treinen, pers. comm., 2006.

ATTACHMENT B: PROCEDURES FOR PROJECTING THE NUMBER OF BUSINESSES ON OWTS

For projecting the number of businesses using OWTS in 2008 and 2013, SWRCB staff initially estimated that the number of businesses currently using OWTS was between 1 and 4 percent of the number of housing units using OWTS. Large-capacity/high-flow volume systems, which were excluded from the analysis due the speculative nature of evaluating the effects of the Proposed Regulations on these systems, are believed to represent about half of the OWTS used by businesses. Consequently, the range for the number of businesses using OWTS as a percentage of households using OWTS was adjusted to 0.5-2 percent.

The estimated range reflects, in part, data provided by an OWTS inventory and report prepared by Sonoma County (Sonoma County 2007) using an EPA Class V injection well inventory grant. (Data from this study was discussed in greater detail in the "Background Information" section of this report.) The reasonableness in using the Sonoma County relationship of the number of businesses on OWTS to the number of housing units on OWTS to estimate the number of business using OWTS statewide was considered questionable. Comparing the number of businesses on OWTS in Sonoma County to the total number of businesses operating in Sonoma County was considered potentially more supportable.

The following calculations show the results of applying both types of relationships to the Sonoma County OWTS data to project statewide usage of OWTS by businesses.

Businesses-to-Housing Units Relationship:

Sonoma County businesses on OWTS (Sonoma County 2007) = 904
Projected 2008 Sonoma County housing units on OWTS (Table 3) = 49,661
Percentage relationship of business on OWTS to housing units on OWTS = 1.8%

Projected 2008 statewide housing units on OWTS (Table 3) = 1,323,533
Estimated 2008 statewide businesses on OWTS = 1,323,533 * 1.8% = **23,820**

Businesses-to-Businesses Relationship:

Sonoma County businesses on OWTS (Sonoma County 2007) = 904
Sonoma County total businesses (U.S. Census Bureau 2006b) = 13,670
Percentage of business on OWTS to total businesses = 6.6%

Applying this percentage to total businesses statewide would be reasonable only if OWTS business usage in Sonoma County is similar to OWTS usage statewide. No data are available to confirm this; however, U.S. Census data on household OWTS usage shows that usage in Sonoma County is relatively higher (24.4%) than it is statewide (9.8%) (Table 2), suggesting that the Sonoma County percentage of businesses on OWTS should be scaled down to better reflect probable statewide business usage. Assuming that the percentage of households using OWTS is a reasonable indicator of the relative percentage of businesses using OWTS, this scaling was done as follows:

9.8% (statewide housing units on OWTS) / 24.4% (Sonoma County housing units on OWTS) = 0.402

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following statewide percentage of businesses on OWTS:

6.6% * 0.402 = 2.7%

Applying this percentage to the total number of businesses statewide yields the following estimate of statewide business OWTS usage:

Total businesses statewide (U.S. Census Bureau 2006b) = 841,774
Estimated statewide businesses on OWTS = 841,774 * 2.7% = **22,300**

As shown, the two methodologies for estimating statewide usage of OWTS by businesses yield similar results (23,820 compared to 22,300 businesses on OWTS). The businesses-to-businesses relationship, however, appears to provide a better approach because it avoids applying a businesses-to-housing units relationship from Sonoma County that may bear little resemblance to the relationship statewide. Assuming that half the businesses on OWTS are using high-capacity systems that are excluded from the analysis, the business-to-business approach indicates that the current percentage of statewide businesses on OWTS is about 1.35 percent. This percentage falls within the initial 0.5-2.0 percent range initially estimated by SWRCB staff. Subsequently, this range (0.5-2.0 percent) was carried forward for projecting the number of statewide businesses using OWTS.

Existing Baseline (2008) Conditions

Statewide Businesses on OWTS in 2008

According to the U.S. Census Bureau (2006b), 841,774 businesses were operating in California in 2004, including 822,230 businesses (97.7 percent) that fall within the small business category (i.e., establishments with fewer than 100 employees). Based on an average annual business growth rate of 1.4 percent between 1994 and 2004, the number of businesses operating in California in 2008 was projected to total 890,400, including 869,700 small businesses. Applying the 0.5-2.0 percent assumed range of businesses on OWTS to this projection yields a projection of 4,450-17,810 business using OWTS statewide in 2008, including 4,400-17,400 small businesses.

Businesses on OWTS in the Case Study Counties of Los Angeles and Merced in 2008

For the case study counties of Los Angeles and Merced, the previously discussed method used to scale the Sonoma County percentage of business on OWTS for statewide usage was used to project the number of businesses using OWTS in these counties under both 2008 and 2013 conditions.

Los Angeles County Businesses on OWTS in 2008:

2.6% (Los Angeles County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.107

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Los Angeles County percentage of businesses on OWTS:

6.6% * 0.107 = 0.7%

Applying this percentage to the projected number of businesses in Los Angeles County in 2008 yields the following estimate of OWTS usage in Los Angeles County:

Total businesses in Los Angeles County in 2008 (projected based on U.S. Census Bureau 2006b) = 252,100 (246,100 small businesses)
Estimated Los Angeles County businesses on OWTS = 252,100 * 0.7% = 1,770 (1,730 small businesses)

Merced County Businesses on OWTS in 2008:

22.3% (Merced County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.914

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Merced County percentage of businesses on OWTS:

6.6% * 0.914 = 6.0%

Applying this percentage to the projected number of businesses in Merced County in 2008 yields the following estimate of OWTS usage in Merced County:

Total businesses in Merced County in 2008 (projected based on U.S. Census Bureau 2006b) = 3,130 (3,070 small businesses)
Estimated Merced County businesses on OWTS = 3,130 * 6.0% = 190 (180 small businesses)

Businesses on OWTS in 303(d) Areas in 2008

For the 303(d) areas, the same methodology used for the case-study counties was used to estimate the percentage of businesses on OWTS in each county that contains a 303(d) area. Based on the assumption that the countywide percentages would also apply to the 303(d) areas in each county, the percentages were then applied to the total number of OWTS within 600 feet of impaired water bodies to estimate the number of businesses that could be affected by the Proposed Regulations. The SWRCB has identified 10 water bodies with adopted TMDLs that identify OWTS as contributing to bacteriologic and/or nutrient impairment. Based on a roof-top count from aerial photographs, the SWRCB (Thompson, pers. comm., 2007) provided estimates of the number of structures (homes and businesses) within 600 feet of the water body that the

Proposed Regulations could affect by requiring them to evaluate and upgrade to performance standards. The SWRCB estimates of structures (homes and businesses) in the 10 watersheds potentially using OWTS within 600 feet of an impaired water body totaled 7,698 units, distributed as follows:

- Malibu Creek (Los Angeles County): 800 OWTS
- Sonoma Creek (Sonoma County): 200 OWTS
- Napa River (Napa County): 350 OWTS
- Northern Santa Monica Bay Beaches (Los Angeles County): 1,563 OWTS
- Santa Clara River (Ventura and Los Angeles counties): 200 OWTS
- Tomales Bay (Marin County): 350 OWTS
- Canyon Lake (Riverside County): 0 OWTS
- Lake Elsinore (Riverside County): 35 OWTS
- Rainbow Creek (San Diego County): 200 OWTS
- San Lorenzo River (Santa Cruz County): 4,000 OWTS

The following calculations were made to estimate the percentage and number of businesses on OWTS in 303(d) areas. (Note: No homes or businesses are located in the Canyon Lake 303(d) area; therefore, businesses were not projected for this area for 2008 or 2013. Additionally, per Item D of the 303(d) section of the Proposed Regulations, the San Lorenzo watershed, Tomales Bay, Sonoma Creek, and Napa River have an exemption from the regulations and are assumed to be unaffected by the regulations; therefore, businesses were not projected for these area for 2008 or 2013.)

Malibu Creek, Northern Santa Monica Bay Beaches, and Santa Clara River 303(d) Areas (Los Angeles County) in 2008:

2.6% (Los Angeles County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.107

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Los Angeles County percentage of businesses on OWTS:

6.6% * 0.107 = 0.7%

Total structures (households and businesses) in Malibu Creek 303(d) area in 2008 (from SWRCB count) = 800
Estimated Malibu Creek 303(d) area businesses on OWTS = 800 * 0.7% = 6

Total structures (households and businesses) in Northern Santa Monica Bay Beaches 303(d) area in 2008 (from SWRCB count) = 1,563
Estimated Northern Santa Monica Bay Beaches 303(d) area businesses on OWTS = 1,563 * 0.7% = 11

Total structures (households and businesses) in Santa Clara 303(d) area in 2008 (from SWRCB count) = 200

Estimated Santa Clara River 303(d) area businesses on OWTS = 200 * 0.7% = 2
(Note: Based on SWRCB counts, 60 percent of the structures in the Santa Clara River 303(d) area are located in Los Angeles County and 40 percent are located in Ventura County. To simplify the projections, the business percentage for Los Angeles County was used to project businesses in this 303(d) area.)

Lake Elsinore 303(d) Area (Riverside County) in 2008:

(Note: The Canyon Lake 303(d) area is also located in Riverside County. No homes or businesses are located in the Canyon Lake 303(d) area based on SWRCB counts; therefore, businesses were not projected for this area for 2008 or 2013.)

18.1% (Riverside County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.742

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Riverside County percentage of businesses on OWTS:

6.6% * 0.742 = 4.9%

Total structures (households and businesses) in Lake Elsinore 303(d) area in 2008 (from SWRCB count) = 35
Estimated Lake Elsinore 303(d) area businesses on OWTS = 35 * 4.9% = 2

Rainbow Creek 303(d) Area (San Diego County) in 2008:

6.5% (San Diego County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.266

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following San Diego County percentage of businesses on OWTS:

6.6% * 0.266 = 1.8%

Total structures (households and businesses) in Rainbow Creek 303(d) area in 2008 (from SWRCB count) = 200
Estimated Rainbow Creek 303(d) area businesses on OWTS = 200 * 1.8% = 4

Future Baseline (2013) Conditions

For projecting OWTS usage to 2013 for statewide businesses and businesses in the two case study counties, including small businesses, the same methodology used to project OWTS to 2008 (discussed above) was used. This resulted in the following projections of business OWTS usage in 2013. For 303(d) areas, the percentages derived above for 2008 conditions were used to project business OWTS usage in 303(d) areas in 2013.

Statewide Businesses on OWTS in 2013

As discussed previously, 841,774 businesses were operating in California in 2004, including 822,230 business (97.7 percent) that fall within the small business category (i.e., establishments with fewer than 100 employees). Based on the 1994-2004 average annual business growth rate of 1.4 percent in California, the number of businesses operating in California in 2013 was projected to total 951,160, including 926,740 small businesses. Applying the 0.5-2.0 percent assumed range of businesses on OWTS to this projection yields a projection of 4,755-19,025 business using OWTS statewide in 2013, including 4,630-18,530 small businesses.

Businesses on OWTS in the Case Study Counties of Los Angeles and Merced in 2013

For the case study counties of Los Angeles and Merced, the previously discussed method used to scale the Sonoma County percentage of business on OWTS for statewide usage was used to project the number of businesses using OWTS in these counties in 2013, as follows.

Los Angeles County Businesses on OWTS in 2013:

2.6% (Los Angeles County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.107

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Los Angeles County percentage of businesses on OWTS:

6.6% * 0.107 = 0.7%

Applying this percentage to the projected number of businesses in Los Angeles County in 2013 yields the following estimate of OWTS usage in Los Angeles County:

Total businesses in Los Angeles County in 2013 (projected based on U.S. Census Bureau 2006b) = 267,790 (261,250 small businesses)
Estimated Los Angeles County businesses on OWTS = 267,790 * 0.7% = 1,870 (1,830 small businesses)

Merced County Businesses on OWTS in 2013:

22.3% (Merced County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.914

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Merced County percentage of businesses on OWTS:

6.6% * 0.914 = 6.0%

Applying this percentage to the projected number of businesses in Merced County in 2013 yields the following estimate of OWTS usage in Merced County:

Total businesses in Merced County in 2013 (projected based on U.S. Census Bureau 2006b) = 3,240 (3,170 small businesses)
Estimated Merced County businesses on OWTS = 3,240 * 6.0% = 195 (190 small businesses)

Businesses on OWTS in 303(d) Areas in 2013

For the 303(d) areas, the same methodology used for 2008 was used to estimate the number of businesses on OWTS in each 303(d) area under 2013 conditions, as shown in the following. (Note: No homes or businesses are located in the Canyon Lake 303(d) area; therefore, businesses were not projected for this area for 2008 or 2013. Additionally, per Item D of the 303(d) section of the Proposed Regulations, the San Lorenzo watershed, Tomales Bay, Sonoma Creek, and Napa River have an exemption from the regulations and are assumed to be unaffected by the regulations; therefore, businesses were not projected for these area for 2008 or 2013.)

Malibu Creek, Northern Santa Monica Bay Beaches, and Santa Clara River 303(d) Areas (Los Angeles County) in 2013:

2.6% (Los Angeles County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.107

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Los Angeles County percentage of businesses on OWTS:

6.6% * 0.107 = 0.7%

Total businesses in Malibu Creek 303(d) area in 2013 (Note: Due to the built-out nature of the Malibu Creek 303(d) area, no growth in businesses is anticipated in this area between 2008 and 2013) = 800
Estimated Malibu Creek 303(d) area businesses on OWTS = 800 * 0.7% = 6

Total businesses in Northern Santa Monica Bay Beaches 303(d) area in 2013 (projected to 2013 based on U.S. Census Bureau 2006b) = 1,665
Estimated Northern Santa Monica Bay Beaches 303(d) area businesses on OWTS = 1,563 * 0.7% = 12

Total businesses in Santa Clara 303(d) area in 2013 (projected to 2013 based on U.S. Census Bureau 2006b) = 217
Estimated Santa Clara River 303(d) area businesses on OWTS = 217 * 0.7% = 2

Lake Elsinore 303(d) Area (Riverside County) in 2013:

(Note: The Canyon Lake 303(d) area is also located in Riverside County. No homes or businesses are located in the Canyon Lake 303(d) area based on SWRCB counts; therefore, businesses were not projected for this area for 2008 or 2013.)

18.1% (Riverside County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.742

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following Riverside County percentage of businesses on OWTS:

6.6% * 0.742 = 4.9%

Total businesses in Lake Elsinore 303(d) area in 2013 (projected to 2013 based on U.S. Census Bureau 2006b) = 42
Estimated Lake Elsinore 303(d) area businesses on OWTS = 42 * 4.9% = 2

Rainbow Creek 303(d) Area (San Diego County) in 2013:

6.5% (San Diego County housing units on OWTS; Table 2) / 24.4% (Sonoma County housing units on OWTS; Table 2) = 0.266

Applying this scaling factor to the percentage of Sonoma County businesses on OWTS yields the following San Diego County percentage of businesses on OWTS:

6.6% * 0.266 = 1.8%

Total businesses in Rainbow Creek 303(d) area in 2013 (projected to 2013 based on U.S. Census Bureau 2006b) = 224
Estimated Rainbow Creek 303(d) area businesses on OWTS = 224 * 1.8% = 4

References

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